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ABSTRACT

This book contains eight case studies that describe the state of vocational, technical, and general education in eight Unesco countries, and the progress toward integration of the three types of education in the countries. Countries examined are Australia, Austria, Brazil, Finland, Hungary, Pakistan, Spain, and the United States. The final chapter of the book presents conclusions derived from analysis of the case studies. A summary of the five conclusions reached shows that (1) a comprehensive secondary education system has not yet become a reality and is not likely to improve in the near future; (2) education needs to improve standards for the recognition of achievement in order to ensure a more just evaluation of knowledge, skills, and attitudes; (3) educators will have to recognize that learning is not an activity that is limited to the schools, but rather one that occurs to a large degree outside the education system (in the family and in employment); (4) the values and objectives of education will have to be reviewed and new criteria and priorities set with a view to increasing the relevance of education to modern society; and (5) only a corps of dedicated teachers and educators and capable administrators and supervisors who are sufficiently open-minded to the needs of the future will be able to make the necessary reforms a reality. (KC)

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The integration of general and technical and vocational education

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Trends
and
issues in
technical
and
vocational
education
3

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Unesco

Titles in this series:

1. *Developments in Technical and Vocational Education: A Comparative Study* (also published in French and Spanish)
2. *The Transition from Technical and Vocational Schools to Work*
3. *The Integration of General and Technical and Vocational Education*

3

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Preface

The promotion of democratization in education and the reorientation of education for the world of work is one of the essential elements in Unesco's programme.

In diversified systems pupils are obliged to make choices at too early a stage; this process may contain elements of discrimination. Unesco's interest in the integration of general and technical and vocational education is therefore both logical and necessary.

This book contains a number of national case-studies on the integration of general and technical and vocational education. Authors, selected in each instance by the Unesco National Commission, worked according to guidelines provided by the Secretariat. Although strict comparisons among countries are difficult to establish, the introduction and the concluding chapter, provided by the Secretariat, should be helpful in highlighting trends. The guidelines on which the case-studies were based will be found in the appendix. Although the range of countries covered by the case-studies may not cover the entire scope of systems, the diversity of the material should provide readers with some insight into the kinds of choices countries have made in this field.

The present study is the third in the series 'Trends and Issues in Technical and Vocational Education'. It is addressed to teacher educators, administrators, planners and all persons interested in the current and future status of technical and vocational education at international level. The long-term aim of the series is to promote the objectives and provisions of Unesco's Revised Recommendation concerning Technical and Vocational Education, which was adopted by the General Conference of Unesco at its eighteenth session in 1974.

We wish to express our appreciation to the authors of the case-studies, who as far as possible followed the guidelines set down and supported their reports with detailed statistical data. Contributions were received from: Australia (J. A. Leech), Austria (F. H. Plank), Brazil (C. A. Tavares), Finland (A. Sarjala), Hungary (J. Földi), Pakistan (M. Popalzai and K. Hashmi), Spain (V. de Miguel Muñoz), and the United States of America (T. Buila).

The views expressed in this book are those of the individuals concerned and do not necessarily reflect those of Unesco. The designations employed and the presentation of the material do not imply the expression of any opinion whatsoever on the part of the Unesco Secretariat concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

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Introduction

According to a dictionary definition, integration means 'the joining together of parts to make a whole which works together as one'. The history of education, especially because of the influence of industrialization, comprises educational subsystems. In some cases (for instance, non-formal education or vocational training) separate systems have come into being, and as a consequence of industrialization and the needs it engenders each of these subsystems has come to have its own philosophy and objectives, leading to an even greater fragmentation of the overall system.

For some time now, governments and professional bodies as a whole have recognized the disadvantages of this separatist approach and have therefore called for an integrated system that would once again unify the subsystems.

On an international level, this desire has also been strongly reflected in the Unesco Revised Recommendation concerning Technical and Vocational Education, adopted by the General Conference at its eighteenth session in 1974. Paragraph 2 of the Recommendation states that technical and vocational education should be seen as: '(a) an integral part of general education; (b) a means of preparing for an occupational field; (c) an aspect of continuing education.'

Paragraph 6 makes it clear that 'technical and vocational education' is a comprehensive term that should not be taken narrowly to mean preparation for a single occupation. Furthermore, paragraphs 6 and 7 make the following provisions

> 6. Given the necessity for new relationships between education, working life, and the community as a whole, technical and vocational education should exist as part of a system of lifelong education adapted to the needs of each particular country. This system should be directed to:
>
> (a) abolishing barriers between levels and areas of education, between education and employment, and between school and society through: (i) the integration of technical and vocational and general education in all educational streams above primary level; (ii) the creation of open and

8

flexible educational structures; (iii) the taking into account of individuals' educational needs and of the evolution of occupations and jobs;

(b) improving the quality of life by permitting the individual to expand his intellectual horizons and to acquire and to constantly improve professional skills and knowledge while allowing society to utilize the fruits of economic and technological change for the general welfare.

7. Technical and vocational education should begin with a broad basic vocational education, thus facilitating horizontal and vertical articulation within the education system and between school and employment thus contributing to the elimination of all forms of discrimination and should be designed so that it:
   (a) is an integral part of everyone's basic general education in the form of initiation to technology and to the world of work;
   (b) may be freely and positively chosen as the means by which one develops talents, interests and skills leading to an occupation in the sectors listed in paragraph 2 or to further education;
   (c) allows access to other aspects and areas of education at all levels by being grounded on a solid general education and, as a result of the integration mentioned in paragraph 6(a), containing a general education component through all stages of specialization;
   (d) allows transfers from one field to another within technical and vocational education;
   (e) is readily available to all and for all appropriate types of specialization, within and outside formal education systems, and in conjunction or in parallel with training in order to permit educational, career and job mobility at a minimum age at which the general basic education is considered to have been acquired, according to the education system in force in each country;
   (f) is available on the above terms and on a basis of equality to women as well as men;
   (g) is available to disadvantaged and handicapped persons in special forms adapted to their needs in order to integrate them more easily into society.

This basic policy is illustrated graphically in Figures 1 and 2.

Whereas the 1962 Recommendation concerning Technical and Vocational Education took the traditional model as a basis, the Governmental Experts' Committee that drafted the Revised Recommendation looked far ahead in forming a new concept—that of lifelong education. This Committee was in particular inspired by the report of the International Commission on the Development of Education *Learning to Be*, one of the major studies of the 1970s. A number of seminars and conferences also supported this trend and brought further information to the Committee, which enabled it to formulate more precise guidelines for Member States. The diagram for a lifelong education system was then adopted as a model for the revision of the 1962 Recommendation and distributed as document ED/MD/28 to Member States for comments.

The recommended strategy for the years to come accordingly fore-

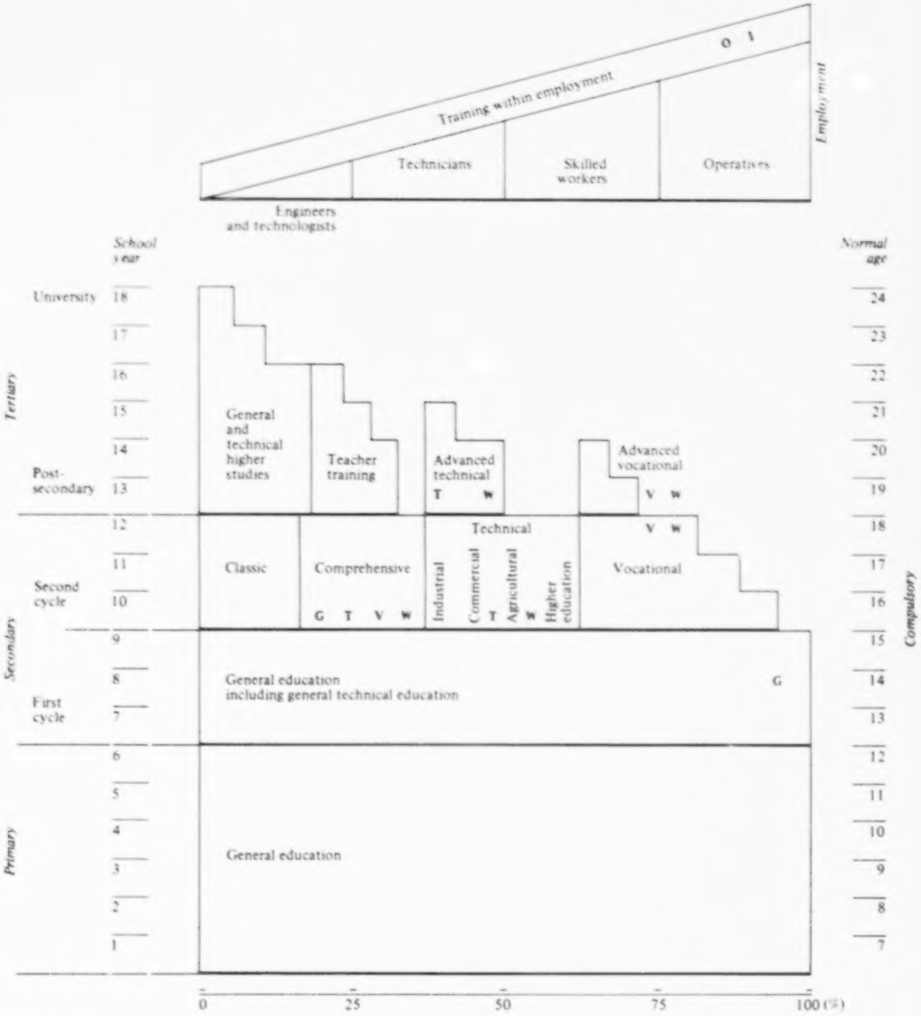
O I
Training within employment
Employment
Engineers and technologists
Technicians
Skilled workers
Operatives
School year
Normal age
University
Tertiary
Post-secondary
Secondary
Second cycle
First cycle
Primary
General and technical higher studies
Teacher training
Advanced technical
T W
Advanced vocational
V W
Technical
Classic
Comprehensive
G T V W
Industrial
Commercial
T
Agricultural
W
Higher education
Vocational
General education including general technical education
G
General education
Compulsory
0
25
50
75
100 (%)

FIG. 1. Traditional educational structure model. G = general technical teacher, V = vocational teacher, T = technical teacher, W = workshop teacher, O = training officer, I = training instructor.

sees, after primary education, one school, preferably comprehensive, for the age-group 12 to 15 years. This school should have a modern approach to general education, the latter being truly general.

A problem of terminology arose during the Experts' Meeting. Many

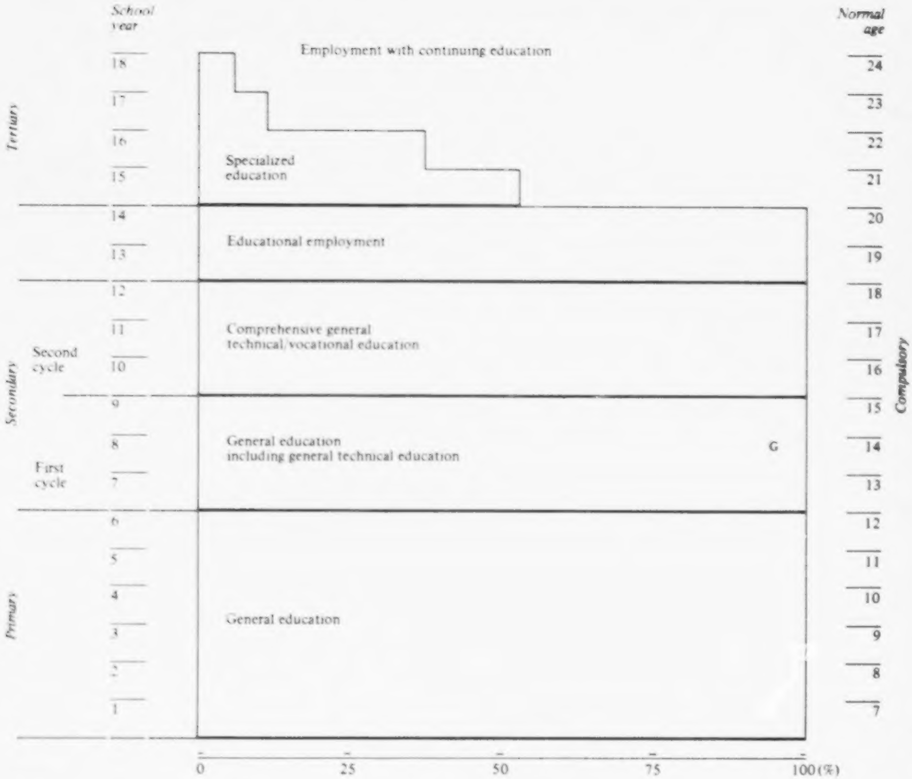
School year
Normal age
Employment with continuing education
Specialized education
Educational employment
Comprehensive general technical/vocational education
General education including general technical education
G
General education
Tertiary
Secondary
Primary
Second cycle
First cycle
Compulsory
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
24
23
22
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
0
25
50
75
100(%)

FIG. 2. Structure model for a system of lifelong education.

terms already exist for this type of education, which covers the technical and vocational aspects of general education. A sampling of terms used in different countries includes practical arts, polytechnical education, prevocational education, technical orientation, manual arts, etc. Chapter IV of the Revised Recommendation offers a clear philosophy of this type of education and adequately covers present trends in the area, as the following case-studies will show. There are, however, differences in the implementation of these programmes, some tending to be essentially theoretical and others more practical. Here again, integration is desirable, specifically with regard to the integration of theory and practice. This method, from a pedagogical point of view, seems to be the most effective.

It is in any case clear that up to age 15 no specialized education should be given. Rather, the education provided should have a general character, the technical and vocational elements serving as orientation by helping students to prepare for active life in the future. Vocational guidance should consequently also play its natural role during this period.

More complicated and more frequently discussed is the reform of upper-secondary education, involving the age group 16 to 19 years. Comprehensive schools at this level are still in an experimental stage, and a number of countries prefer a diversified system. Academic education has continued its role of preparing an élite, while vocational training prepares those who do not find a place in the academic system.

Upper-secondary education has been considered a period in which the learner has made a decision or should make a decision on his future role in society, employment and active life. Some systems offer a basic course, postponing the decision to the last or the next to last year, and sometimes offer the possibility of learning two trades, thereby enabling a choice to be made at a later stage.

In other countries, specialized vocational schools have their proper place and are fully equal to their counterparts in general education. After graduation, students may pursue their studies at higher-education establishments.

The major problem at the upper-secondary level lies in the fact that parallel training systems are created that cater to this age-group. These systems provide vocational training for skilled workers but do not allow for the pursuance of further studies. Such programmes are usually administered outside the educational system and are strongly oriented towards the needs and demands of employers. This situation clearly involves a certain conflict of interests—the needs of the individual learners do not always coincide with those of the employers. For the democratization of the system, it is important to find a balanced solution to the problem. The technical and vocational education system is more often oriented towards the individual learner's needs, in so far as it provides the necessary background for future mobility and for adjustment to technological changes. It does not, however, provide the narrow specialized training employers prefer in order to raise production. Nevertheless, the system must take into consideration employers' interests, and close co-operation, if not integration, between education and employment is highly desirable.

A number of provisions in this regard have been made in the Revised Recommendation, but as vocational training comes within the field of competence of the International Labour Organisation (ILO), mention should be made of ILO Recommendation 150 concerning Vocational Guidance and Vocational Training in the Development of Human Resources, and of ILO Convention 142 on the same subject, which states in Article 2:

> With the above ends in view, each Member shall establish and develop open, flexible and complementary systems of general, technical and vocational edu-

cation, educational and vocational guidance and vocational training, whether these activities take place within the system of formal education or outside it.

The term 'open' system may be taken here to mean connections between education and training and possibly periods in employment. Further information will be given concerning this level of education and training in the concluding chapter of the present study.

Reverting to the diagram that illustrates the Unesco Revised Recommendation concerning Technical and Vocational Education, a very innovative measure may be noted after the upper-secondary level. This is so-called educational employment—a one- to two-year period is recommended before entrance into higher education or before making a decision on actual employment. This employment period would be educational in nature, and strong guidance should be provided to the learner. It might be considered a sort of modern apprenticeship.

It was also thought that such an approach would provide the proper foundation for lifelong education, which should in fact be made up of alternating periods of learning and work.

In consequence, the Unesco Revised Recommendation states in paragraph 13(a) that consideration should be given to 'multipurpose secondary education offering diversified curricula including work-study programmes' and recommends, in paragraph 59, that 'Guidance in technical and vocational education as preparation for an occupation field should ... (d) supplement the later stages of the programmes by short periods of work experience and study of real work situations'.

The integration of technical education into general education will not pose a serious problem, in particular where the field of technical education is of a more academic type, e.g. commercial education. The real problem is to find ways of integrating vocational training and general education. The lack of recognition of practical work in the educational field seems to be a particular handicap. There is still a long way to go to find a system that gives full equivalence and credit to practical work as an educational element in its own right.

Integration is therefore a complex problem that cannot be solved merely by changing the structure of the system or by setting up coordinating bodies, but must also take account of the problems of equivalences and qualification. The following case-studies, carried out under contract with Unesco, describe various endeavours in the field. Certain guidelines were followed in the preparation of the studies so as to allow the reader to compare the various approaches to the integration of general and technical and vocational education. These guidelines, which are given in the Appendix, concentrate on the secondary level of the formal education system, distinguishing between the first and the second stages of secondary education. The guidelines likewise offer suggestions in respect of a graphic presentation of the overall educational system. The last chapter of the book offers a brief analysis of the trends in this area, based on the case-studies and on the results of some recent Unesco conferences.

The case-studies were completed early in 1980, and the time references in them should be read accordingly.

Case-studies

Australia: a Queensland study

J. A. Leech[1]

Profile of second-level education

Structure of the system

In Queensland attendance at school is compulsory between the ages of 6 and 15. The school system is based on seven years of primary education followed by a five-year secondary-education programme. In addition, parents may choose to send their children to pre-school.

Since 1960, the majority of students have remained at school until the completion of the third year of secondary education (year 10), at which point about 90 per cent receive a Junior Certificate. A number of educational opportunities then exist for such students. They can continue at school to year 11 or 12 or leave school and undertake other studies, on a full-time or part-time basis, in institutions funded by the state or Commonwealth governments, in which tuition is free. Additionally there are numerous private organizations conducting courses for which fees are charged.

In recent years, approximately 50 per cent of year-10 students have chosen to remain in school with the intention of securing, after two years of further study, a Senior Certificate. At the end of year 12, opportunities exist for them to undertake further post-secondary studies on either a full-time or part-time basis.

Post-secondary education in Queensland consists of an array of institutions, classified as universities, colleges of advanced education and technical and further-education institutions, offering a broad selection of educational programmes for a range of students with varying educational backgrounds.

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[1] This study was prepared in consultation with other officers of the Queensland Department of Education. Their assistance is gratefully acknowledged.

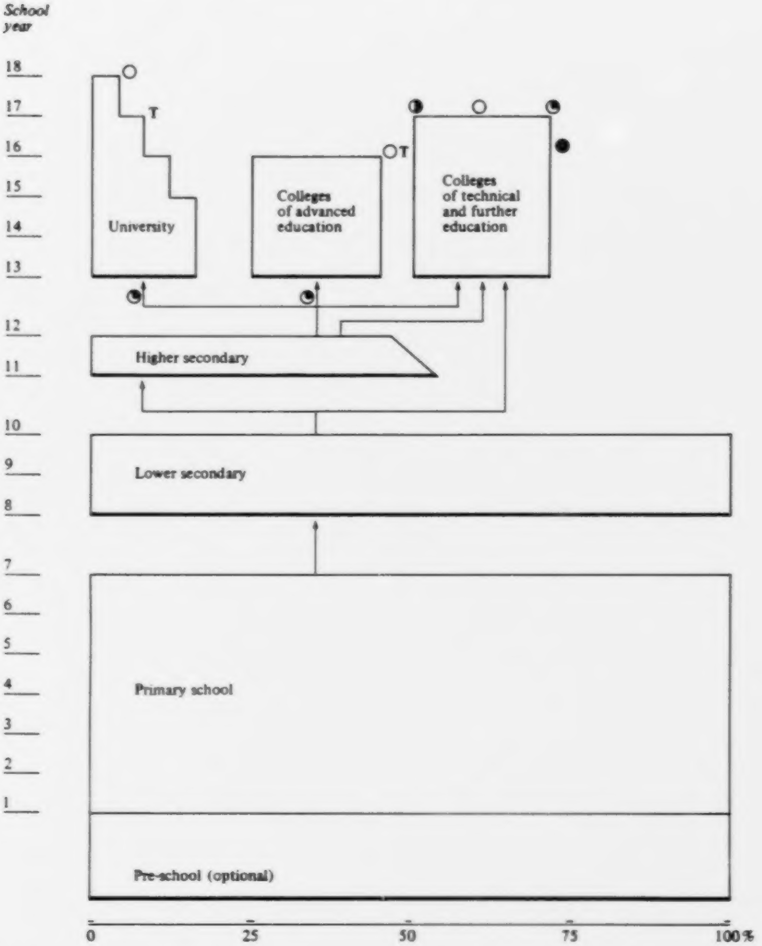

School year
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
T
OT
University
Colleges of advanced education
Colleges of technical and further education
Higher secondary
Lower secondary
Primary school
Pre-school (optional)
0
25
50
75
100%

FIG. 1. Queensland education system. Graph is based on 1976 data. Because of the structure and nature of technical and vocational education in Queensland, it is difficult to represent this sector diagramatically in such a way as to allow valid comparisons to be made with the balance of the education system. For example, technical and further education in Queensland is undertaken, in the main, as a part-time activity by people who may be in employment. As such, it caters for a range of ages which is considerably wider than for other sectors. Further, it is difficult, if not impossible, to convert part-time enrolments over such a wide age range to meaningful full-time age equivalent figures. For this reason, the representation of colleges of technical and further education on the diagram should not be interpreted in proportional terms.

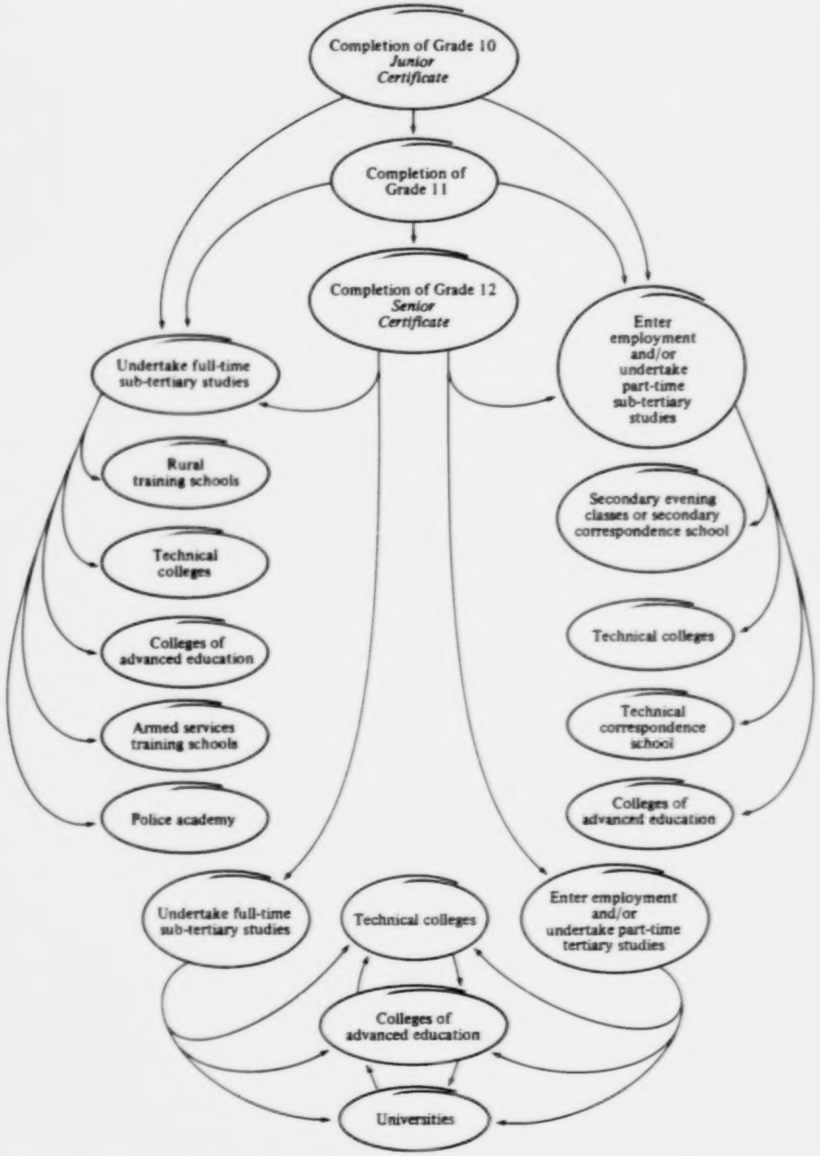

Completion of Grade 10 *Junior Certificate*
Completion of Grade 11
Completion of Grade 12 *Senior Certificate*
Undertake full-time sub-tertiary studies
Enter employment and/or undertake part-time sub-tertiary studies
Rural training schools
Technical colleges
Colleges of advanced education
Armed services training schools
Police academy
Secondary evening classes or secondary correspondence school
Technical colleges
Technical correspondence school
Colleges of advanced education
Undertake full-time sub-tertiary studies
Technical colleges
Enter employment and/or undertake part-time tertiary studies
Colleges of advanced education
Universities

FIG. 2. Patterns of post-secondary education opportunities available to school-leavers.

Transition from primary to secondary schooling occurs without examination. At the end of the third year of secondary schooling (year 10) a Junior Certificate is awarded, with a Senior Certificate awarded after five years (year 12). Student assessment at the secondary level is conducted within each school, together with a system of moderation by the Board of Secondary School Studies to ensure uniformity of awards among schools. A Tertiary Entrance Score is derived from school assessments scaled against the Australian Scholastic Aptitude Test, which is taken each September by year-12 students. Tertiary Entrance Scores are used by all tertiary institutions in Queensland to select students for admission.

Technical and further-education institutions (TAFE) do not have uniform examination requirements for admission. They offer study opportunities to people with a wide variety of educational backgrounds and life experience. Among their students are some who have had only minimal or even no secondary education, some who have proceeded to the end of secondary education and some who are graduates of tertiary institutions.

Secondary-level enrolment

All students in Queensland undergo a general secondary education. No particular types of programme specifically oriented to university preparation or technical and vocational training are offered.

Retention rates can be examined from two perspectives: (a) the proportion of an age-group attending schools (the participation rate) and (b) the percentage of students from a particular grade who have continued to any subsequent grade (the retention rate of grade cohorts).

Participation rates

Approximately one-third of both males and females enter high school at the age of 12. The majority of students enter high school at the age of 13; 75 per cent of males and 71 per cent of females stay on at high school voluntarily after attaining the age of 15, the legal age at which a person can leave school. The age participation rate at high school drops below 50 per cent at age 16 for both males and females.

Students are awarded a Junior Certificate on the completion of year 10, and as well most students attain the age of 15 during the year. Slightly over 50 per cent of students elect to leave school after obtaining the Junior Certificate, and this is reflected in the drop in the number of 16-year-olds enrolled at high school.

In general, the proportions of males and females of an age-group attending school are much the same.

TABLE 1. Enrolments, teachers and pupil/teacher ratios (PRT) for 1975 to 1978 (based on the August school census)

Year	Secondary		
	Enrolment	Teachers	PRT
1975	102 459	6 824	15.0
1976	105 771	7 186	14.7
1977	106 430	7 510	14.2
1978	106 248	7 453	14.3

Retention rates of grade cohorts

Very few students leave school before completing year 9.

Retention to year-10 level has exceeded 90 per cent from 1976 onwards. Schools have experienced a lower loss of students during year 10, as students complete their compulsory education. The decline in employment opportunities has probably resulted in the greater retention rate.

The proportion of year-10 students continuing into year 11 is approaching 50 per cent. The retention rate to year 12 is approximately one-third.

Enrolments rose steadily in secondary schools between 1975 and 1978. The number of teachers employed increased at a faster rate than the growth in enrolments, with the exception of 1978, when there was a slight decline in the number of teachers employed in secondary schools. As a consequence, the teacher-pupil ratio steadily declined with the exception of 1978, when it rose very slightly. This rise may reflect budget constraints, which put an effective limit on the number of teachers who could be employed.

Administration

Control of the Queensland Department of Education's professional and administrative functions is vested in the permanent head of the department, the Director-General, who is responsible to the Minister for Education. He is assisted by a Deputy Director-General, an Assistant Director-General and a Chief Administration Officer. (See Fig. 3.)

Boards

There are a number of autonomous boards that advise the Minister for Education:

The Board of Advanced Education makes reports and recommendations to the minister with respect to developments in the field of advanced

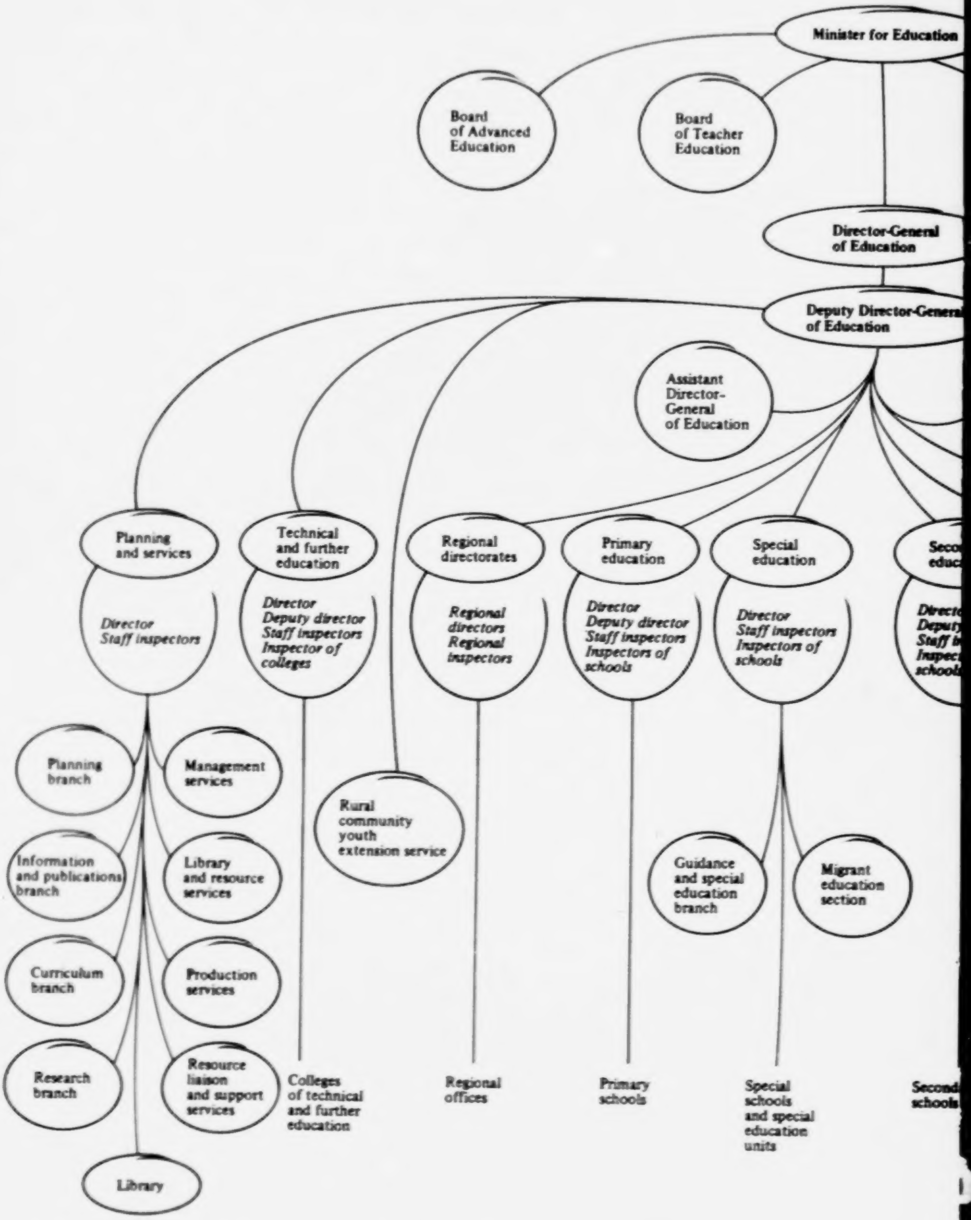
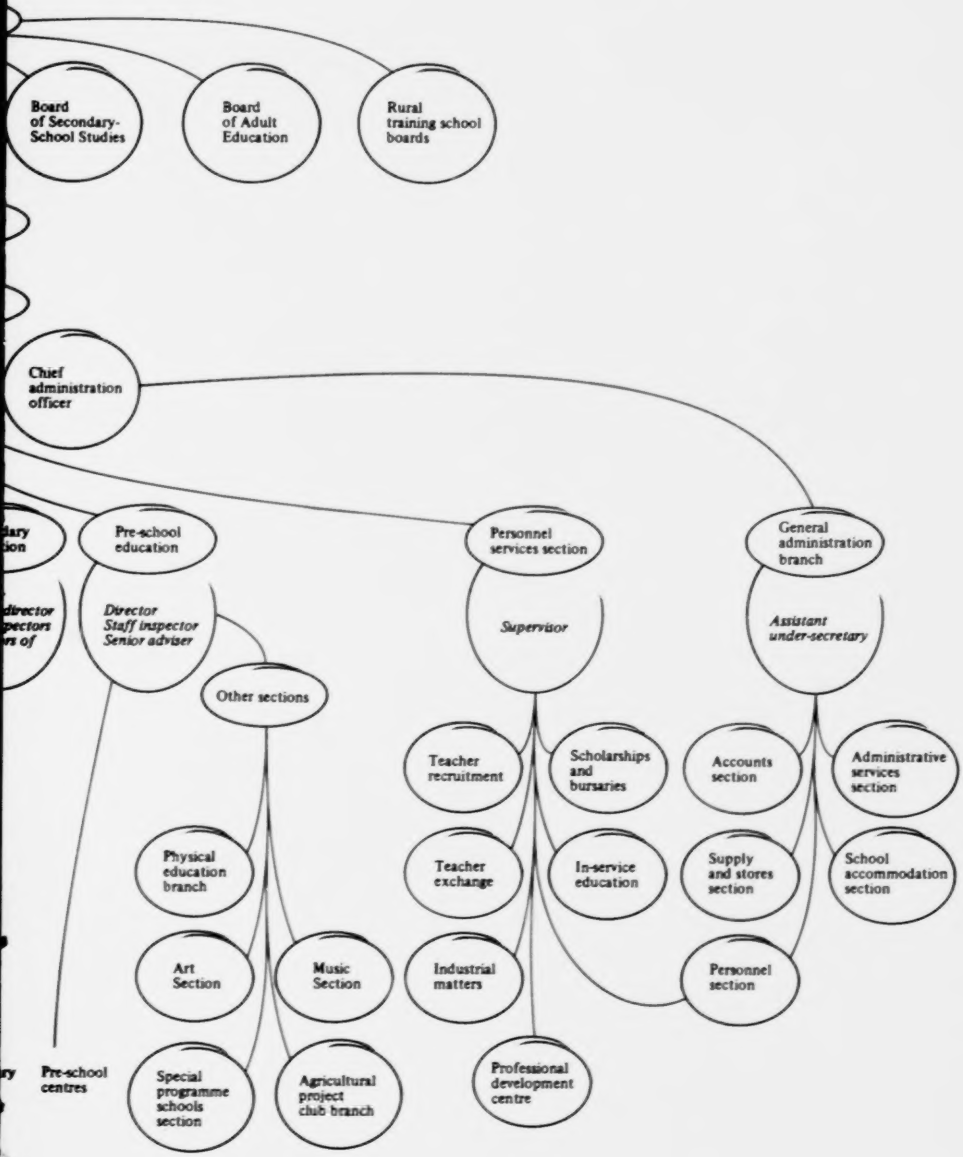

Minister for Education
Board of Advanced Education
Board of Teacher Education
Director-General of Education
Deputy Director-General of Education
Assistant Director-General of Education
Planning and services
Director
Staff inspectors
Technical and further education
Director
Deputy director
Staff inspectors
Inspector of colleges
Regional directorates
Regional directors
Regional inspectors
Primary education
Director
Deputy director
Staff inspectors
Inspectors of schools
Special education
Director
Staff inspectors
Inspectors of schools
Seco
educ
Direct
Deputy
Staff i
Inspect
schools
Planning branch
Management services
Information and publications branch
Library and resource services
Curriculum branch
Production services
Research branch
Resource liaison and support services
Library
Rural community youth extension service
Guidance and special education branch
Migrant education section
Colleges of technical and further education
Regional offices
Primary schools
Special schools and special education units
Second
schools

FIG. 3. The administration of state education, Queensland.


Board of Secondary-School Studies
Board of Adult Education
Rural training school boards
Chief administration officer
dary
tion
director
pectors
rs of
Pre-school education
Director
Staff inspector
Senior adviser
Other sections
Physical education branch
Art Section
Music Section
Special programme schools section
Agricultural project club branch
ry
Pre-school centres
Personnel services section
Supervisor
Teacher recruitment
Scholarships and bursaries
Teacher exchange
In-service education
Industrial matters
Professional development centre
General administration branch
Assistant under-secretary
Accounts section
Administrative services section
Supply and stores section
School accommodation section
Personnel section

education, capital and recurrent expenditure in colleges of advanced education, and salaries and conditions of employment of advanced education staff.

The Board of Teacher Education is responsible for the continuous review of teacher education, the registration of teachers and the accreditation of teacher education awards.

The Board of Secondary School Studies advises on courses of study, assessment and the issue of certificates to secondary school students.

The Board of Adult Education advises on the provision of recreational and personal enrichment courses of further education.

The boards of rural training schools supervise the provision of subtertiary-level courses for students training for managerial duties on farms and properties.

Divisions

There are six administrative units in the head office of the Department of Education, five of which are responsible for particular levels or sectors of education. These five divisions cater for pre-school, primary, secondary, special, and technical and further education. A sixth, the Division of Planning and Services, provides a range of services for other sections of the department, irrespective of the level of education concerned.

The divisions concerned with particular levels of education have the following functions: appointment and deployment of teaching staff, employment of ancillary staff, in-service education and teacher development, budget formulation and financial management planning of capital-works programmes, determination of materials and equipment provision, curriculum development and implementation, assessment of schools, and liaison with parents' and citizens' associations.

The Assistant Director-General of Education and the Chief Administration Officer have particular responsibilities with respect to the co-ordination of the operations of these divisions.

Regions

The state is divided into nine administrative regions, each under the supervision of a regional director. As a general principle the regional offices of education are responsible for the implementation of departmental policies at a local level. They provide close contact between the department, schools and local communities.

Because routine administration is the responsibility of regional offices, the head office in Brisbane is able to focus on co-ordination and planning to ensure the provision of an extensive range of specialist services for the entire state.

Financial situation

In 1977/78 recurrent educational expenditure in Queensland totalled $453,122,809. Recurrent expenditure is made up of salaries, wages, payroll tax and cash equivalent long-service leave, materials, equipment and incidentals. Of the total Queensland recurrent expenditure, $28, 822, 647, or 6.36 per cent, was allocated to technical and further education (TAFE).

In 1978, 3,254 full-time students and 71,048 part-time students were enrolled in TAFE institutions. Given that TAFE courses are so varied in length and patterns of teaching, statistics on enrolment do not provide an adequate base to directly establish cost per student. For this reason the enrolment of part-time students is weighted and an equivalent full-time student enrolment derived. In 1978 the estimated equivalent full-time student enrolment was 21,852. Based on this enrolment the cost per student enrolled full-time in TAFE was $1,318.99.

No data are available to indicate the financial situation of non-formal training systems.

Policy of secondary education: its formulation and trends

The policy of the Queensland Department of Education is that education should always be viewed in the context of providing for individual development and meeting community needs. The development of employable skills is an essential element in meeting the needs of the individual and of society. This must therefore be a major objective of education in secondary schools (particularly beyond the compulsory attendance age), and in colleges of technical and further education.

In general most students are not able to complete various important developmental processes during their years of compulsory education. Hence the last two years of secondary schooling and/or the first few years of vocational training provide an important educational environment in which these students complete their physical growth, mature emotionally and develop important intellectual structures needed for their transition to the work-force and to society. It is in these years (15+ to 17+) that many youths establish their individual integrity, independence and autonomy and begin to develop the personal philosophy on which to base moral judgement.

The education system has the responsibility of providing a suitable environment in which young people can grow and develop in ways esteemed by the individual himself, by the local community in which he lives and by society as a whole.

Underlying philosophy

The major aim in the first three years of secondary education is to provide for individual development and to ensure that all students acquire the basic competencies necessary to later employment or to further studies or, on a broader scale, for personal fulfilment.

For as many students as possible, career options should be kept open as long as they can be. This does not mean excluding vocationally oriented subjects from secondary schools. To keep career options open as long as possible necessitates the co-ordinating of various courses of study within the different institutions and between institutions, to ensure maximum ease of transition from one programme to another.

The fact that the administration of all areas of education has been the responsibility of a single authority, a Director-General of Education responsible to one Cabinet Minister, has simplified the co-ordination of general secondary and technical education. Legislation, where it is necessary, is prepared within a single department.

A complicating factor has been that, whereas constitutionally the administration of education in Queensland, as in other states of the Commonwealth of Australia, has been a state responsibility, provisions in the constitution have also allowed the federal government to make grants to the states for specific purposes. Successive federal governments, through the use of tied grants, have exerted a steadily increasing influence on education in the states. Administration in all areas of education has become much more complex as a result.

In recent years, greater emphasis has been placed on vocational education, and this has been reflected in increases in federal funding in this area. The need to provide administrative data and to develop policies to qualify for this federal funding has been an important factor causing an increase in size in the organizational structure for the administration of technical education and a greater independence from other administrative areas of the Department of Education. An unfortunate consequence has been the duplication of administrative structures and a reduction in the degree of co-ordination at lower administrative levels.

Changes and prospects

While officially in Queensland there has been no change in policy regarding integration of secondary and technical education, in practice a significant separation has occurred. This appears to have been recognized within the department, and positive action has recently been taken designed to improve working relationships.

In 1979 a Parliamentary Select Committee on Education in Queensland published a series of interim reports that, among other things, recommended that a Ministry for Post-Secondary Education should be established separate from the present Ministry for Education. The purpose of this recommendation is to improve the co-ordination of universities, colleges of advanced education and colleges of technical and further education. It remains to be seen whether this recommendation will be endorsed by the government and, if so, whether an improvement of co-ordination at the tertiary level will involve more distinct separation between the secondary and technical education sectors.

Within the Department of Education separate planning groups operate for (a) secondary education and (b) technical and future education. Ultimately, however, the responsibility for accepting or rejecting plans lies with the senior administrative staff and, in particular, the Director-General of Education. The need for a co-ordinated approach to planning has been well recognized, particularly in avoiding unnecessary duplication of facilities that essentially provide the same services.

However, despite the commitment to a planned and co-ordinated approach, the techniques available for planning have proved inadequate. In line with experience overseas, attempts at manpower forecasting have proved relatively unsuccessful. While some success has been achieved in forecasting requirements for teachers, the effectiveness of forecasting in other occupations has been very limited. It has not proved possible to make accurate allowance for variables such as social, economic, technological and organizational change.

In general, planning has been aimed at meeting the social demand for educational provision. The link between the social demand for educational places and labour-market opportunities is at present tenuous. Efforts are being made to strengthen that link through a greater emphasis on career education and work experience in secondary schools.

Major issues

In the first stage of secondary education, direct and indirect constraints have in the past limited the availability of subjects in the curriculum with a large vocational emphasis. Until recent years, boys were directed into manual arts while girls took home economics. Business principles, shorthand and typing were offered to all, but social pressures resulted in their being taken almost exclusively by girls.

In addition, subjects such as woodwork, metalwork and technical drawing were offered as alternatives to subjects such as history, geography, and foreign languages. The guidance given to students in the selection of subjects usually rested on the results of previous school-attainment tests supplemented by tests of aptitude and interests. Higher-ability students were steered toward academic subjects. Since the interests of the students often reflected the interests of the home, a class distinction was apparent. For example, one measure used for boys was a tool-knowledge test. Those from homes where the father was a tradesman tended to fare better on this test than those from homes where the father was in a professional occupation. High results on the test were one indicator used to suggest that the student should select the vocational subjects.

Integration strategy

Three related trends in recent times have led to quite dramatic changes that are still in progress. First, as more responsibility for curriculum development devolved on the schools, a more flexible response was made to differing needs of individuals. This resulted in many schools in a smorgasbord type of curriculum in which a wide range of electives was made available on a line system in place of the streaming into courses that had existed previously.

Secondly, small but active pressure groups within the teaching profession joined forces with groups outside the school in demanding changes in subject selection based on sex stereotyping. Schools began to make manual arts and commercial subjects more freely available to girls and home economics to boys. Some schools in year 8 timetabled all students, boys and girls, into both manual arts and home economics.

The third trend resulted from a disillusionment with the results of the liberal choice of subjects offered to students. Even after careful guidance provided by the schools, very large numbers of students were choosing subject combinations that were seen to be imbalanced and unlikely to provide the experiences necessary for successful living. Recognition has been growing of the need for a core and elective structure in the curriculum. The curriculum is being reorganized in this direction, and in some cases one or more of the vocational subjects are being incorporated into the core.

These trends have together improved the equality of access to all sections of the curriculum, with regard to social class and sex distinction.

A major factor militating against the wider acceptance of technical subjects has been the unwillingness of tertiary institutions to accept them for matriculation purposes. In the second stage of education, students selecting one or more of the very limited range of technical subjects would do so at the risk of lessening or eliminating their opportunity to proceed to universities. While outwardly in recent years there has been some liberalizing of requirements by tertiary institutions for prerequisite studies, the practical effect of this has been fairly small. Because of the geographical dispersal of the population, the senior sections of many schools are small, and the range of subjects that can be offered economically is limited. This range has of necessity included mandatory subjects for matriculation for a range of faculties and institutions. This has led to the continuation of a marked bias against technical types of studies in favour of academic studies.

Another factor militating against an increased offering by schools and selection by students of technical subjects has been that the system of tertiary entrance scores, which ranks students for the award of the limited number of tertiary places, has not given adequate recognition to achievement in technical subjects.

The limited range of subjects offered in Stage 2 education in secondary schools has drawn strong and increasing criticism from influential sections of the community. As unemployment of young people has increased and as larger numbers of students with a wider range of interests and aptitudes have returned to schools after completing their Junior Certificate studies, the problems have been exacerbated.

One partial solution put forward is the provision of a different form of accreditation for those subjects that do not lead to tertiary studies. One such form could be through the system of assessment used in colleges of technical and further education, which is at present quite independent of the system used in secondary schools. The progress toward solution of these problems has been disappointingly small.

In common with other states of Australia and some overseas countries, there has been growing public concern in Queensland over the last five or six years about the adequacy of schooling as a preparation for employment. A significant proportion of the statements appearing in the media has been employer-originated. Some of the employers' concern appears to have stemmed from increasing difficulty in attracting applicants for employment from the higher-ability end of the spectrum. This increasing difficulty has occurred as a larger number of students have opted to continue their education beyond the age of compulsory education and on to the tertiary level.

In a state where the government builds its policy on encouraging the free-enterprise system, employers bring to bear a very strong political influence.

This influence was one of the major factors that led in 1977 to the setting up of a Parliamentary Committee of Inquiry into Education in Queensland, which addressed itself very early on to the question of standards. Despite submissions from employer groups implying that standards were falling and asserting that students were not being prepared adequately for employment, the committee's third interim report, released in May 1979, found that there was no evidence that standards were falling and attributed dissatisfaction to rising levels of skill necessary for employment. It did, however, emphasize the need for schools to do more to raise the level of the functional education of students whose level of skills at present was not sufficient to fit them for the type of employment currently available.

While the Parliamentary Committee of Inquiry was operating at the state level, a federal committee (the Williams Committee) also examined the adequacy of secondary schooling as a preparation for employment. This committee again was unable to find evidence of falling standards.

Despite the publication of the findings of these two reports, criticism of the schools has continued, and a further inquiry has been initiated at federal level.

A number of factors appear to have contributed to raising and maintaining the level of public concern about the country's schools. In 1976 a study was completed that quantified the level of functional literacy and numeracy. While this study showed that the position in Australian schools compared favourably with the position in other Western countries, nevertheless the numbers of Australian children reported as having a level of educational achievement that left them unable to meet the demands of everyday living came as a surprise to many who studied the statistics. This report came at the end of a period of high employment when many of these children were the only potential employees available for positions that demanded a higher level of skill than they possessed. Employer dissatisfaction under these conditions was inevitable.

In recent years there has been a marked downturn in the number of positions available to those entering the work-force and hence a correspondingly high level of unemployment. Employers in many cases have for the first time in many years been able to select carefully from a wide range of applicants for the comparatively few positions available. The level of dissatisfaction may have been expected to fall as a result. However, a certain momentum of criticism appears to have been generated by the published statements of the previous period. In addition, in some cases, faced with the new task of appointing employees from a large number of applicants, selection techniques have not been sufficiently sophisticated, resulting in poor choices; and any decrease in the dissatisfaction of employers with the education system appears to have been compensated for by the criticism of parents of students and the students themselves who have been unable to find places in the work-force. Some politicians appear to have been ready to let the schools shoulder the blame for unemployment and even to push the blame in the direction of the schools, when the statistics show quite clearly that there are not sufficient positions available for the number of young people seeking work.

It might have been hoped that schools could capitalize on this situation by attracting additional funds to improve effectiveness and to keep more students at school for a longer period, thereby reducing the labour market. There is certainly the scope for the latter.

However government economic policy is based on an anti-inflationary restriction of public spending. The alleged inadequacies of the schools have been used as a reason to curtail spending of money, which is seen to have been invested unsuccessfully in education over the past decade.

Thus schools face conflicting demands—to improve effectiveness, to widen the range of courses available and to economize in the use of funds.

One of the few avenues that appears to have been opened in achieving these aims has been closer co-ordination of the functioning of secondary and technical institutions. However, there has been a tendency to limit spending in secondary education but to continue to increase spending in technical institutions. The latter, in some cases, see themselves as having opportunities to improve their operations after a long period of inadequate funding. They see themselves as being able to do this most effectively from a position of independence.

Unlike the position in some other Australian states, the gap between technical and secondary schooling has tended to widen in Queensland over the past few years. For many years technical colleges functioned in many localities as annexes of the secondary schools. Over the last decade colleges of technical and further education have been established as independent entities. In 1978 the introduction of the pre-vocational course in colleges of TAFE with an element of general education incorporated, established an alternative form of education available to students having completed the period of compulsory education.

Some limited progress has been made in improving co-ordination through the establishment of link courses. A three-man committee representing secondary education, the TAFE sector and the teachers' industrial organizations formulated principles under which link courses between various institutions might function in a trial period. The aim is to make it possible for students to attend classes simultaneously in different institutions, with joint accreditation. A number of trials have been set up, but progress is very slow.

Integration at the first stage of the secondary level

From 1964, when the recommendations of the Watkin Committee were implemented, the Queensland education system has provided for seven years of primary schooling and five years of secondary, with the secondary component divided into a three-year junior course and a two-year senior course. This committee also recommended that the years of compulsory schooling should be extended, and thus, since 1964, the leaving age has been 15 years, to which age a junior secondary course is open to all students with no process of selection being applied.

The first stage of secondary education is provided in comprehensive state high schools and secondary departments. Secondary departments are located in rural areas, are attached to a primary school and primarily cater for secondary students in years 8 to 10, although some students study to the year-12 level. As at 1 August 1979 there were 131 high schools and 66 secondary departments in Queensland.

Curricula

Before discussing the subjects offered for study in state secondary schools in Queensland, it is necessary to examine briefly the groups responsible for the development of curricula. These are: (a) the Board of Secondary School Studies and its committees; (b) the Directorates of Secondary Education and Planning and Services, and other specialist sections within the Department of Education; and (c) the principals and staff of individual schools.

Among the functions and powers of the Board of Secondary School Studies set down in Section 37 of the Education Act 1964–1974 are: '(a) to advise the Minister on secondary education, regard being had to the requirements of a sound general education and to the specific needs of students related to their age, aptitude, ability and special interests; (b) to issue Junior Certificates and Senior Certificates in accordance with the regulations; (c) to approve syllabuses for those subjects designated or to be designated Board Subjects on Junior Certificates and on Senior Certificates'.

These functions are carried out through the Board's Curriculum Committee and through its eleven Subject Advisory Committees and their subcommittees. Under Section 41 of the Education Act, the Subject Advisory Committees have a key role in the preparation of broad framework syllabuses.

The broad framework syllabuses prepared by the Board of Secondary School Studies and its committees, together with guidelines and resource lists provided either by the board or by the department (which has a direct responsibility for the interpretation and implementation of these syllabuses within its own schools), provide the basis for further curriculum development at the school level. It is the principal's responsibility, through the subject masters and subject area teachers, to interpret board syllabuses to suit local needs and conditions. This is achieved through the development of detailed work programmes, and complementary programmes of assessment, and the selection and provision of suitable textbooks and other resources. The work programmes and assessment programmes are subject to the board's moderation procedures.

In addition to offering a range of the Board Subjects already discussed, individual State secondary schools may also prepare and implement, with the approval of the Regional Director of Education, particular subjects designed to meet students' specific needs. While these

School Subjects may be listed on board certificates, they are not subject to the board's moderation procedures.

Range of subjects currently offered

Year 8. The first year of secondary schooling is one in which students become adjusted to the new school environment and are introduced to a wide range of subjects. It is, however, a year of definite educational achievement that forms the basis for studies in subsequent years. Practically all students undertake the following common courses. English, mathematics, geography, history (study of society may be taken instead of geography and history), a foreign language, science, art, music, physical education (including sport), home economics and/or manual arts. Time is made available for ministers of religion to provide religious education within either denominational or interdenominational settings.

The small proportion of students who are not considered capable of profiting from the study of a foreign language usually have one additional period allocated to each of the subjects English, mathematics and science.

In year 8, most schools offer students a choice between home economics and manual arts, which usually results in girls selecting the former and boys the latter. Many schools merely allocate all their girls to home-economics classes and the boys to manual-arts classes. However, an increasing number of schools are now providing both subjects as part of the common course for all year-8 students. This is implemented by either reducing the time allocation for each subject, with students studying both subjects throughout the year, or by having students study each subject for half a year only.

The home economics/manual arts choice represents the only difference at year-8 level in the curricula and subjects offered to and required of girls and boys.

Years 9–10. All secondary schools offer a range of Board Subjects to allow students wide subject choice. A particular school's ability to offer a given Board Subject is governed partly by student and community needs for that subject, and partly by the availability of suitably qualified staff and/or appropriate facilities, such as equipment, and specialized teaching spaces. These offerings may be augmented by School Subjects.

Thirty-five Board Subjects are available in years 9–10. Not all, however, are offered in all state high schools. The full range of Board Subjects is English, English expression, French, German, Indonesian/Malaysian, Italian, Japanese, Latin, Russian, citizenship education, geography, history, social studies, study of society, advanced mathematics, ordinary mathematics, general mathematics, science, general science, business principles, rural bookkeeping, shorthand, typewriting, general commercial studies, home economics, woodwork, metalwork, technical drawing, agricultural mechanics, animal husbandry, agriculture, art, music, speech and drama, health and physical education.

As indicated earlier, most year-8 students undertake similar courses. From year 9, students and their parents are increasingly involved in the selection of the subjects that the students will study. The school, however, has a duty to ensure that the range of subjects selected for each student is reasonably balanced and will not unduly restrict his or her eligibility to continue studies at a higher level or subsequent employment opportunities. In order to achieve this, schools give a great deal of thought both to the range of subjects offered at each level, and to the kind and number of combinations of subjects that students may choose. They also offer students and parents considerable guidance as to the issues involved in course and subject selection. In these ways, it is hoped that both balance and specialization are given due consideration.

There are two main ways in which courses or subject combinations are presented for selection. One method is to offer a number of set, or partly set, courses. Each student then selects the particular course he or she wishes to follow. An example of this method (in this case for year-10 students in a country secondary department) is given below.

General. English, maths, science/general science, French/citizenship education, history/typing, geography, technical drawing/business principles.

Commercial. English/English expression, maths, science, general science/shorthand, French/citizenship education, typing, geography/home economics, business principles.

Technical. English/English expression, maths, science/general science, citizenship education, manual arts, technical drawing.

Home economics. English/English expression, maths, science/general science, general commercial studies, citizenship education, home economics.

The second method of presenting the full array of subjects for selection is to divide into a number of groups of 'lines' that cut across subject-area boundaries. Each student chooses one subject from each line. A number of large schools use this method to provide a much larger range of subject combinations. One such scheme (in this case for year-10 students in a large city high school) is shown below:

Line 1	English/science/typing
Line 2	English/science/art/typing/business principles

Line 3	Mathematics: advanced/ordinary/general
Line 4	French/German/citizenship education/study of society/technical drawing/physical education/shorthand/business principles
Line 5	Geography/art/home economics/woodwork and metalwork/physical education
Line 6	History/home economics/shorthand/woodwork and metalwork/technical drawing/typing/business principles

While most of the schools using this method offer six lines, as does this one, some offer seven or eight.

At present the only subject that is compulsory in years 9 and 10 is English. Nearly all students also study mathematics, although it is not compulsory. However, there is a move within the Department of Education towards prescribing a common curriculum for students in year 9, which would include studies in each of the following areas: communication; mathematics; people and society; science; environment; health, growth and physical development; and fine, performing and practical arts.

In year 10, it is being suggested to schools that the year-9 programme may be carried through with or without amendments, or alternatively, programmes may be offered with a greater degree of specialization catering for identified needs of specific groups of students. However, English and mathematics should be offered as obligatory subjects in all courses in year 10.

All subjects mentioned are open to both girls and boys, although obviously certain subjects tend to be chosen almost exclusively by one sex.

Since 1946 a course in 'mothercraft', recently re-named 'parentcraft', has been offered on a one-lesson-per-week basis over twelve weeks to all year-9 girls. The course is taught by trained sisters, from the Maternal and Child Welfare section of the state Department of Health, who visit all secondary schools throughout Queensland. However, this course is currently under review by an interdepartmental committee, with an aim towards developing a programme that is appropriate for both boys and girls.

Objectives, organization and content

For many years, an important objective of the secondary system has been to keep open students' career options as long as possible. This has been necessary to make allowances for the growing difficulty experienced by young people in making career choices in a complex labour market, and to reduce the number of costly mistakes made. The policy in secondary education has been to recognize the need for secondary schools to provide general vocational preparation within the context of a broad general education. High schools and technical colleges co-operate in many ways, and an objective of secondary education has been to assist in the growth and development of this co-operation and to increase co-operation in the area of design and accreditation of curricula. The areas of general education and vocational education overlap and interlock to such an extent that there appears to be no value in attempting to identify the differences in the meanings of the two terms. Secondary schools in Queensland have recognized a responsibility to give general preparation to students for employment, and a large proportion of high school students each year have moved quietly, with few problems, directly into employment.

It is the Department of Education's view that, ideally, vocational education should be built onto a strong general and academic base, the latter traditionally being the predominant concern of the secondary school and the former the concern of specialist post-secondary schools and colleges.

While ideally vocational education should be built on a general education programme extending at least through the secondary school, it is becoming increasingly difficult to provide appropriate courses in the early years of secondary schooling for those students who will leave at the end of year 10 and enter employment. The reasons for this difficulty are, *inter alia*, that (a) technology has resulted in the majority of occupations requiring a high level of skill and technique; (b) some types of work are disappearing entirely because of automation and changing consumer habits; and (c) the range of vocations has increased to such an extent that the secondary school cannot offer courses appropriate to all.

The response to these problems has been to recognize the importance of a sound general education that will fit individuals for training on the job, but at the same time acknowledge that the secondary school should provide some vocational orientation, including the development of vocational skills that have general applicability in commerce and industry. The early school-leavers' prospects of employment are related to the acquisition of skills in both these areas.

Consequently, elements of the curriculum have been developed to contribute directly to the objective of preparing students for employment. Although placed within subjects that have general education aims, these elements develop skills, such as shorthand and typing, that have general applicability in commerce and industry. Other curriculum areas in which important and fairly direct contributions have been made to preparation for employment include woodwork, metalwork, technical drawing, agriculture and animal husbandry. Thus some subjects, such as those mentioned, have a greater, or more direct, vocational orientation than others. To mention these subjects, however, is not to underestimate the importance of the contribution of other subjects in the preparation of students for entry to the work-force. Practically any subject in the curriculum can be regarded as assisting students in some way to be more effective in whatever occupation they pursue.

As already outlined above, no subjects offered at the compulsory level of secondary education can be treated as strictly vocational. All subjects contribute to a general education, but within some subjects certain skills are developed that are applicable to a number of occupations. Three groups of subjects have been selected for this paper as providing the most appropriate examples of developing such skills. These are commercial studies, agriculture and manual arts.

Commercial studies

While the area of commercial education in Queensland state secondary schools may seem to have close vocational and technical ties, it is viewed, particularly during the years of compulsory education, in relation to its contribution to general education. This is particularly so in the Junior Secondary (year 8–10), where courses such as typewriting, business principles and practice, shorthand and commercial studies are offered as part of the school curriculum. In the Senior Secondary School (year 11 and 12), greater subject specialization occurs as students prepare themselves for the world of work, or for further education.

Agriculture

At the first stage of secondary education in Queensland, four agricultural subjects are offered: agricultural science (in years 8–10) and agriculture, animal husbandry and agricultural mechanics (all in years 9 and 10).

The course in agricultural science has yet to become available to all schools for implementation. A syllabus for this new subject was developed by the Agricultural Advisory Committee of the Board of Secondary School Studies and this has now been tested over three years in years 8–10. It was anticipated that this subject would soon move to the pilot stage and then become available to any school at year-8 level.

The stated aim of agricultural science is 'to permit students to establish a concept of agriculture as part of the broader sociological, cultural, economic and environmental systems of which they are part'. The course has been designed to encourage students, particularly in urban secondary schools, who are not necessarily interested in a career in agriculture, to learn about the principles and problems of agriculture in our modern society. Thus agricultural science is the most broad and theoretical, and the least vocationally-oriented, of the four agricultural subjects taught at this level.

Three syllabuses in agricultural subjects, namely agriculture, animal husbandry and agricultural mechanics, are provided in years 9 and 10.

These subjects are intended to develop students' awareness and understanding of the environment, the interrelationships and dependencies existing within it, with particular, though not exclusive, reference to the rural sector. It also provides opportunities for understanding the concepts and technologies of the processes and machines used in agricultural practice.

The cognitive aims of the syllabuses seek to develop knowledge and understanding of agricultural practices and techniques, as well as developing problem-solving abilities and skills that particularly relate to agriculture. These aims are seen to relate to the following areas in agricultural education: (a) terminology and conventions; specific facts and concepts; principles and generalization in agriculture, animal husbandry and agricultural mechanics; (b) the collection, use and dissemination of agricultural information; the tabulation, interpretation and extrapolation of agricultural information; and (c) the identification of agricultural problems, hypothesis formation and agricultural experimental design, the evaluation of results.

The manipulative aims of the syllabuses are concerned with the development of behavioural patterns and skills that enable students to use correctly the materials and equipment common to agricultural pursuits. As such the course forms a significant section of the overall aims of agricultural education. These aims relate to the student's ability to: (a) sketch, assemble, operate, dismantle and maintain agricultural and other farm equipment; (b) record accurately, sketch and tabulate observations; and (c) carry out project and field work.

Affective aims are concerned with the development of personal behavioural patterns. Agricultural education is seen as providing a unique context for learning experiences and in assisting the development of attitudes that encourage the student to be: (a) curious and objective, (b) rational and honest, (c) tolerant and co-operative, (d) persistent and (e) confident.

These syllabuses are not prescriptive. Each one is based on a series of units that need not necessarily be seen as discrete units, so that the approaches and teaching strategies developed will vary with the individual teacher. The units and topics are not sequential, and the order in which they are taken is left to the discretion of the teacher. In common with other Board Subjects, the time devoted to each agricultural subject in years 9 and 10 should be 100 hours per year.

Although no specific guidelines are provided to teachers on the actual amount of practical work that should be undertaken, practical work is fully integrated with theory in all three agricultural subjects. After studying the theory in the classroom, students are then involved in their school's field laboratory in 'hands-on' activities that enable them to put newly learned theory into practice. A wide range of activities that normally take place on commercial and experimental farms are undertaken, such as milking cows, conducting feeding trials on different breeds of fowl, pruning and grafting citrus trees, observing pests in an orchard and applying treatment procedures. In addition students visit commercial farms and participate in demonstrations conducted by local farmers and other agricultural personnel who are invited to the school. Such people often set up experiments at the school's field laboratory, which the students continue to monitor. Produce from school field laboratories is sold, and students have the opportunity to be involved in practical farm accounting. All schools with field laboratories are supplied with tractors and a range of other agricultural equipment. As students are expected, especially in animal husbandry and agricultural mechanics, to develop skills in operating and maintaining animal handling equipment and farm machinery, considerable time is spent in practical work.

Manual arts

Manual arts is regarded as an integral part of general education and not as a narrow, vocationally-oriented, hand-skill-biased subject area. It is concerned with skills, problem-solving, planning, designing, general knowledge, technical knowledge, communicating, co-operating, concern for the welfare of others, personal achievement, consumerism and technological development and its effects—all of which are elements of a general education. However, these understandings and skills are directly relevant to a range of trades, in particular, as well as to the world of work in general.

Manual arts aims to develop: safety awareness; skills in critical thinking, decision making and problem solving; technical knowledge; psychomotor skill; communication skills; understanding of the relevance of technology to changes in society; technical literacy; an appreciation of quality in workmanship; economic competence; an awareness of the need for conservation of natural resources; personal qualities of independence of thought, tolerance, initiative, self-reliance, confidence, co-operation and a sense of satisfaction in personal achievement; interest in the creative use of leisure; awareness of vocational responsibilities; and aesthetic appreciation.

In year 8, manual arts is a combination of general shop and graphics. It is designed around the following four areas: (a) practical shopwork, which involves the use of a range of materials in a wide range of workshop experiences; (b) technology, which mainly concerns the nature of materials; (c) communication, which concentrates on graphical communication; and (d) guided research, which is used to broaden knowledge through field trips, audio-visual materials and library utilization.

Manual arts for years 9 and 10 comprises three subjects: General Shop A, General Shop B and Graphics. There is no compulsion for students to enrol for any of these subjects. Depending on the structure of courses being offered in particular schools, students may enrol for any one or any combination of these subjects.

Methods and materials

In technical and vocationally oriented subjects a variety of education methods is used in the process of implementing the various courses. Teachers vary their approaches in the teaching of courses and units of work, and may use some of the following criteria in deciding which methods ought to be used for particular purposes: preferred teaching styles, student needs and interests, class groupings, available resources (materials and personnel), nature of the task, time available, student age and maturity, school policy, community resources, applicability to local conditions, and accreditation and certification requirements.

Teachers generally ensure that a range of teaching/learning activities is used throughout their programmes.

The educational resources that teachers use in this process of teaching/learning to a large extent rely upon the access that each school has to various primary, secondary and community sources. These include both print and non-print resources. Many school courses are based upon a limited set of reference materials supported by other enrichment materials and experiences that are used for particular purposes within the content of the overall aims and objectives of the particular course.

In the commercial courses offered in the Junior School, teaching/learning activities include discussions, debates, lectures, role plays, research, games, simulations, inquiries, community visits, field excursions, project work, problem-solving. The decisions made in this regard, however, are the responsibility of the school and individual teachers as they develop a programme of work to implement the various courses.

The syllabus documents for the agricultural subjects suggest that the following teaching/learning methods might be used in the implementation of the course objectives: 'Teaching sessions; practical sessions; field work; project work; individual assignments; visits to Agricultural Institutions and by their officers; controlled experiments, demonstrations and observations are all seen as possible teaching strategies. Specific collections and the use of audio-visual material will prove useful.' No specific textbook is used for any of these courses, but a list of suitable reference materials and other resources has been produced for agricultural teachers by one of the department's support service sections, the Agricultural Project Club Branch.

In manual arts generally the General Shop segment has been worked around exercises and projects designed to introduce particular materials, processes, tools and equipment and to develop particular skills. Some teachers adopt a design education or problem-solving methodology at various stages, while others adopt a method based on project planning and design. Methodologies applied in Graphics vary somewhat. Some teachers take a formal approach in that draftsmanship and principles of orthographic projection are given high priority. Other teachers take an informal approach in that they relate aspects of graphical communication to outdoor, home and work environments and work towards formal drafting.

Very few schools specify or use textbooks for General Shop in year 8. Use is made of class notes and library materials. However, in years 9 and 10 it is expected that with the increased emphasis on knowledge in the recently revised General Shop syllabus, greater use will be made of text and reference material. Audio-visual materials are used in varying degrees, although schools are supplied with a small number of loop films. A central film library has numerous films suitable for year-8 General Shop. Additional strip films are being produced by the department to support recently introduced areas of study such as art metalwork and surveying.

It is common for schools to take advantage of offers made by private firms to provide wall charts and literature on technical matters.

At the year-8 level, students mainly use basic hand tools for working wood, plastics and metals, including bench drills, soldering irons, disc sanders, strip heaters and hot-wire cutting equipment for plastics. At the year 9 and 10 level students are able to use additional workshop machines and equipment as follows: portable belt sander, portable jigsaw, portable orbital sander, bar bending machines, curving rolls, folding machines, pipe bending machines, power hack saw, hot-air plastics welding gun, spot welding machine and (where available) spray painting equipment.

Many schools specify a textbook and/or a commercially produced workbook for Graphics in year 8–10. Pre-printed drawing sheets are in common use. Grid sheets are commonly used for introductory work in orthographic and pictorial drawing. Very little audio-visual material is available. Drawing rooms are equipped with drawing boards and T-squares. Drafting machines are not provided.

Traditionally in the field of manual arts in Queensland, curriculum offerings have been restricted to woodwork, sheet metal work, elementary fitting and turning, and technical drawing. Enrichment of the curriculum is achieved with the introduction of modern materials and other manipulative skills. These aid the development of technological understandings in secondary school students of both sexes.

Physical facilities

The traditional view of manual arts is reflected in the physical facilities provided in schools. All state schools catering for secondary students are equipped with workshops for woodworking and for metalworking.

In larger schools these facilities are duplicated, but in several schools where enrolment does not justify full duplication a third workshop (a composite containing elements of both of the other types of workshop) is provided.

In years 8, 9 and 10 the emphasis in the curriculum is on development of manipulative skills. To this end workshops are mainly equipped with hand tools. In the wood workshop basic equipment is provided for each student to have a bench space with vice and a kit of basic tools—hammer, plane, chisels, mallet, square, etc. the workshop is equipped with the following portable power tools for students' use: belt sander, disc sander, poker work tool, orbital sander and a wood turning lathe (for use by students in years 9 and 10). A saw bench/planer combination is provided to all centres, but its use is restricted to teachers in preparing materials for student use.

The metal workshop is similarly equipped for hand skills with engineers' vices and kits of basic sheet metal and fitting tools. Sheet metal stakes are available for class use, while a metal turning lathe and drill press are provided for students in years 9 and 10. Gas-heated stoves enable soldering irons to be heated.

Materials used have extended to plastics so all centres are now equipped with facilities for handling sheet thermoplastics materials. Buffing machines, hot-wire machines and strip heaters are supplied to all centres, together with other miscellaneous equipment items such as ovens, electric soldering irons and vibroengravers.

The equipping of workshops to cater for all possible developments has been considered impossible. An approach has been taken in providing a space which is as open as possible to allow for future innovation without expensive redevelopment.

Drawing rooms are provided as a basic facility, all students being provided with drawing boards and T squares. Limited use of drafting machines is made in years 11 and 12. Again in years 11 and 12 provision is made for introductory work in production of working drawings through simple reproductive processes, though expensive reprographic machines are not provided.

Safety is the paramount consideration in room design and choice of equipment. On grounds of safety certain equipment and processes are not allowed in schools. Processes forbidden are: metal casting, resin casting, electro-plating, embedding resin, glass reinforced plastics, and the production of polyurethane foam.

Differences between rural and urban areas

The curriculum guidelines developed in this state provide a framework upon which individual school courses are developed. Since each school has this curriculum development responsibility, programmes of work do vary from school to school as each school attempts to design programmes suitable to the needs, interests, and abilities of its students. There are statewide processes and procedures that are employed to ensure that there is comparability between the programmes offered in schools. The variance in use of content and in the implementation of programmes is not so much based on rural-urban differences but school-to-school differences involving such criteria as staff professionalism, school policy, resource allocations, and student needs, interests and abilities. Small country schools do tend to have younger and less experienced staff, but one cannot generalize.

There may be some vital differences in the programmes offered in urban and rural schools because of community expectations and the quality of the community resources upon which the school can draw. For example, country schools would be at a disadvantage compared to city schools in implementing Unit V of the Accounting Syllabus in year 12 because they would not have access to the range of data-processing systems available to city schools. However, for agricultural subjects the situation is reversed. Secondary schools in urban areas are disadvantaged because they have difficulty in obtaining their own field laboratories and visiting commercial farms and other agricultural enterprises. For this reason a more theoretically based course, agricultural science, already referred to, was developed to encourage urban schools to offer some agriculture to their students. At present only two city schools, both of which have a field laboratory, offer agricultural subjects.

In manual arts, although all schools are similarly equipped, some schools have slight advantages over others with regard to availability and cost of materials. For example, schools close to sawmills, ply-mills, particle-board mills, plastics distributors, hardware suppliers, etc. have an advantage over schools not adjacent to such places. In some cases rural areas have the advantage (eg. with timbermills) and in others, urban areas are better off. Implementation has its problems in remote areas of the Gulf of Carpentaria and on Cape York Peninsula, where it is difficult and expensive to maintain supplies. Material needs to be brought in at least twelve months in advance in such places.

Urban and rural areas each have advantages and disadvantages with regard to types of field trips that may be initiated. Rural areas are generally able to take advantage of primary industries while the urban areas are able to take advantage of secondary industries for field studies.

Similarly, a slight difference is evident in the type of projects carried out for manual arts in some rural and urban schools. In those cases articles are made to suit local needs. Overall, however, project work is basically the same throughout the state.

There are some differences in rural and urban schools regarding maintenance of equipment and buildings. Metropolitan schools and most provincial city schools are able to call on the Works Department to assist with maintenance. In rural schools, a local private contractor is engaged, if one is available. If none is available, it may be necessary to send items of equipment elsewhere for repair. This can be very unsatisfactory as students may be deprived of the use of those items for long periods.

Some consumable material is supplied to schools through the Department of Education's Supply and Stores Section, but this is generally limited to materials commonly used by all schools, e.g. tinplate, strip galvanized metal and certain steel sections. Schools in remote areas can make special requests for supply of materials, but of course this is generally not as convenient as being able to purchase on sight and when required.

Teachers

All teachers who undergo teacher training in tertiary institutions in Queensland complete a minimum three-year course leading to the Diploma in Teaching. Some students undertake degree courses plus teacher training at universities, which are either integrated or end-on courses of four years' duration.

Prospective teachers of manual arts in secondary schools may complete training in one of two ways:

On completion of year-12 studies, students may enter the three-year Diploma of Teaching (Secondary Manual Arts) programme. In addition to the normal programme of educational studies, these students study woodwork, metalwork and drawing. A second teaching subject is also studied, normally either mathematics, science or English.

A second course that can be taken is the Diploma of Teaching (Secondary Manual Arts) Tradesmen Entry. This programme is offered to tradesmen who have successfully completed at least year 10 in secondary school and also a suitable apprenticeship, usually in a woodworking or metalworking trade. About five years' trade experience is preferable before students are selected for entry, although some students are admitted with less experience. These students undertake a four-semester course that includes the normal programme of educational studies. In addition, studies are undertaken in woodwork, metalwork and drawing. A second teaching subject is also studied, which is usually mathematics, science or English. On completion of the four-semester course, students are awarded the three-year Diploma of Teaching, having been given one year's exemption on account of their trade qualifications and experience.

There is no difference between the qualifications and status of general teachers and those of manual-arts teachers.

Each student's progress through years 6 and 7 (primary school) and years 8, 9 and 10 is recorded on a School Record Card. This card contains details of birthday, other members of the family, health record, results of teacher assessments and of standardized tests as well as comments considered to be of value in decision-making.

Guidance

The Guidance Officer assists in decision-making, especially at the end of years 8 and 10, but is available at any other time for consultation with students or parents. Decisions are entered on the School Record Card for future reference.

The students from years 8 to 12 receive assistance in decision-making by a staff of seventy full-time Guidance Officers. The present ratio of students to Guidance Officers is nearly 2,000 to 1, but this varies. The officers are supported by Regional Guidance Officers in seven regional headquarters and by District Guidance Officers in three remote areas based on Roma (South-West), Longreach (Central-West) and Mount Isa (North-West). They receive assistance from nine Career Information Advisory Teachers, one in each administrative area, who do not conduct individual interviews but keep careers libraries up to date, conduct class talks, careers evenings, careers visits.

Guidance Officers usually have the following facilities: an office with an extension telephone; all necessary books of reference on courses and careers; and access to administrative staff—cases may be discussed with the principal, deputy principal, senior mistress, subject master, form master or members of staff. The principal's secretary normally keeps an appointment book for the Guidance Officer.

The materials available to Guidance Officers include:

A Careers Guide, which is kept up to date by an Information Officer and staff at state headquarters.

Information leaflets and posters.

A Careers Library available to students. (If the Careers Library is not a section of the main library under the control of the librarians it is set up in a room adjacent to the Guidance Office, and in some cases is monitored by senior students, usually volunteers from year 11.)

Video tapes, 16 mm films, colour slides for use as support material when giving class talks on courses and careers. Some of these materials come from other state and Commonwealth departments and from private companies, but the Guidance and Special Education Branch prepares its own media materials with the assistance of the Media

Branch of the Education Department; and periodicals such as the year-7 leaflet issued to all year-7 students in November; the 'Year 10 Crossroads', issued to all year-10 students in September; 'Your Next Step', issued to all year-12 students annually; the Commonwealth Department of Employment and Youth Affairs *Australian Job Guide* published in Melbourne; and the *Queensland Job Guide* published in Brisbane. There is also a student newspaper published by the Queensland Career Education Association.

Each Guidance Officer has a set of standardized tests that may be used when further information on students' abilities is required. These are especially valuable if a student is referred by a teacher who feels that achievement is not in keeping with expectation and also when students come from other states or from overseas.

Selection

As a consequence of the Radford Report, a system of internal school assessment with external moderation to replace external public examinations was progressively introduced from 1970. Student ratings under this system are accepted by students, parents, teachers, Guidance Officers and many employers as a valid basis both for programme selection and employment. However, some of the larger employers, including some government departments and statutory boards, administer their own selection instruments. As a result of these changes the general use of standardized tests has been restricted, although such tests may still be used with particular students.

The choice of a particular subject programme in secondary schools is assisted by student ratings and counselling but rests ultimately with the student and his parents.

Reforms

The Director of Secondary Education's Committee on Secondary Education, established some years ago, recently asked principals of high schools and secondary departments to consider establishing a curriculum task group within their schools to undertake a review of subject offerings and the combinations of subjects being selected by students in the junior secondary school. One of the principles that these groups were requested to apply was: 'At least until the end of year 9, the curriculum should consist of a *balanced* combination of subjects.'

One suggested method to enable groups to assess whether the combination of subjects being selected is balanced was to use the following criteria for balance developed by the Director's Committee on Secondary Education: (a) studies in communication; (b) studies in mathematics; (c) studies of people and society; (d) studies of science; (e) studies of environment; (f) health, growth and physical development; (g) fine, performing and practical arts. As a result of applying these criteria a number of schools have noted a deficiency in the category of fine, performing and practical arts. To overcome this problem some schools are planning to offer manual arts as a compulsory subject in years 8 and 9 for all students.

The number of students able to study manual arts has been extended further by a recent innovative project. This project, funded by the federal government, has been developed to provide manual-arts instruction to students from years 6 to 12 in remote rural areas where facilities are either limited in scope or non-existent. It involves three teachers equipped with a mobile workshop and caravan who travel around eleven centres in south-west and central-west Queensland, spending four weeks at each centre. A four-week trial was conducted in 1978, and the project became fully operational in 1979.

Prior to the arrival of the mobile workshop team, secondary correspondence students are sent a 'pre-workshop kit' consisting of notes, audio tapes, slides and video tapes to help them attain a state of readiness. These kits are designed to introduce tools and equipment, materials, safety requirements and workshop projects. Thus on arrival of the workshop team a concentrated course in practical work can be undertaken. Following their departure a 'post-workshop kit' is sent to evaluate progress and offer home projects.

A major problem encountered in beginning this project was the difficulty of finding a mobile workshop that met the specifications required. Therefore it was necessary to design and commission the construction of a special unit. Since the whole concept was experimental, much of the manufacture had to be by trial testing. For example, the floor bracing to run lathes, milling machines, hand saws, etc., without vibration required a structure strong enough to allow removal of a large vertical section of the side walls (complete with doorways), but rigid enough to travel on rough outback roads. However, such difficulties were overcome, and the completed unit approximates an open 9.1 × 7.3 m classroom with air conditioning, lighting and all workshop facilities up to year 12. It consists of two workshops, each 9.1 m long and 2.4 m wide, which are parked 2.4 m apart to allow a central annexe area with a canvas roof to be constructed between them. Two towing vehicles, one of which caters for both oxy- and electric-welding, and two generating sets mounted in a trailer make up the mobile complex.

An evaluation of the project is currently being undertaken.

TABLE 2. Sex and average age of students in second stage of secondary education in state high schools, secondary departments and secondary correspondence schools (at 7 August 1979)

Year	M	F	Total	Average age
11	6 154	6 321	12 475	16 yrs, 2 mths
12	4 271	4 839	9 110	17 yrs, 2 mths

TABLE 3. Sex of students in second stage of secondary education in evening classes (at 1 August 1979)

Full-time				Part-time			
Year	M	F	Total	Year	M	F	Total
				11	53	25	78
12	129	212	341	12	723	935	1 658

Integration at the second stage of the secondary level

In Queensland the organization of the second stage of secondary education is the same as for the first stage. Referred to as years 11 and 12 or Senior, it is provided at 131 comprehensive, co-educational state high schools and a number of non-state schools. In addition, students can study part-time in the evening for the Senior Certificate at one of three metropolitan high schools in Brisbane or do some subjects at local high schools or technical and further-education colleges in the country. For those students unable to attend day or evening classes, some Senior subjects can be studied through a Secondary Correspondence School.

Students may leave school at the age of 15 years, the end point of compulsory schooling. However, any student who wishes to proceed to years 11 and 12 may do so. The majority of such students proceeding to year 11 have completed year 10, but no standard or level of achievement is specified. Similarly there are no pre-requisites for enrolment in any subject: students may study a subject they have not attempted in years 8, 9 or 10.

The number of mature-age entrants into year 11 has been increasing over the last few years, with a small number of high schools particularly encouraging the enrolment of such students. Any individual who is 20 years of age or older, who has left school prior to completion of Senior, and who wishes to return to school to undertake Senior is regarded as a mature-age student.

The range and average age of students in the last two years of secondary schooling are set out in Table 2, and distribution by sex at the same level is indicated in Tables 2 and 3.

Curricula

Even at this second stage of secondary education, all programmes are regarded as providing a general education, and thus all students at this level are undertaking a general programme. However, about twelve high schools offer alternative non-matriculation courses (in year 11 only), which have been introduced to cater for the needs of students who would, in better economic conditions, leave school at the end of year 10 to enter the work-force. These courses frequently include the development of work-oriented or vocational skills and usually contain a work-experience component.

No figures are available on the number or proportion of students currently involved in alternative non-matriculation courses. The proportions of students enrolled in the three most vocationally-oriented Board Subject areas are indicated in Table 4.

TABLE 4. Proportions of students enrolled in the three most vocationally-oriented Board Subject areas

Area	Year	Subject	Percentage of year population
Commercial studies	12	Accounting	30.2
	12	Elementary secretarial studies	2.6
Agriculture	11	Agriculture	1.7
	12	Agriculture	1.4
Manual arts	11	Geometric drawing and perspective	25.2
	12	Geometric drawing and perspective	20.2

As for years 9–10, schools offer a range of Board and School Subjects for students in years 11 and 12. Thirty-five Board Subjects are available at this level. Again, however, some would not be offered in all state high schools, and some are not offered at all within the state secondary system. The full range of Board Subjects is: English, French, German, Indonesian, Italian, Japanese, Russian, Chinese, Greek (Classical), Hebrew, Latin, ancient history, modern history, geography, economics, logic, mathematics I, mathematics II, general mathematics, social mathematics, chemistry, physics, biological science, earth science, multi-strand science, agriculture, accounting, elementary secretarial studies, home management, home economics, geometrical drawing and perspective, art, music, speech and drama, health and physical education.

To obtain entry to a tertiary institution students must undertake at least five Board Subjects.

The range of School Subjects offered varies considerably from school to school. Examples of School Subjects offered in 1979 are: Australian history, advanced typing and clerical studies, behavioural science, business education, business typing, basic office procedures, basic economics, consumer education, dance, Government, industrial techniques, man and society, manual arts, media, office practices, secretarial practice, social education, senior technical arts, technology, and vocational and social communications.

Students who do not intend to proceed to tertiary education may select a combination of Board and School Subjects. However, all Board and School Subjects are optional, with English being the only compulsory subject. The methods by which schools offer subjects for selection in years 11 and 12 are the same as outlined for the first stage of secondary education.

All the Board Subjects, and most School Subjects, available at the years 11 and 12 level are intended to contribute to the general education of students rather than provide specific technical or vocational training. However, some of these subjects do develop skills that have relevance for a number of occupations. In addition many School Subjects have been introduced at this level to provide more practical curriculum offerings than the traditional academic curriculum, for students who wish to enter the work-force directly from secondary education. As suggested by the titles listed above, some of the subjects are vocationally oriented. The development of School Subjects results from specific student needs and interests identified in a particular school. But it remains entirely optional whether students elect to study any technically or vocationally oriented subjects.

Collaboration with outside agencies

Curriculum planning in consultation with government and non-government agencies occurs to varying extents at both the systems level and the school level.

At the systems level the links with these agencies are both formal—through committees—and informal—through personal contacts established by departmental officers. For example, the department's Work Experience Advisory Committee includes representatives from the following organizations: Queensland Trades and Labour Council, Combined Industrial Unions Committee, Department of Employment and Youth Affairs, Department of Labour Relations, Department of Children's Services, Queensland Confederation of Industry, Metal Trades Industry Association, Parents and Citizen's Organization, and Queensland Career Education Association.

The functions of this committee include advising the Director-General on the formulation of policy regarding work-experience programmes and their implementation, and facilitating the dissemination and feedback of information regarding work experience to all interested parties in the community.

Officers of the Curriculum Branch maintain a close liaison with various officers in other agencies in order to ensure that materials and information disseminated to schools are both accurate and relevant. Such liaison assumes particular importance when resource materials are being developed. Although other government and non-government personnel are usually only involved as consultants, there have been some cases where joint responsibility with the Department of Education has been accepted for the development and production of materials. For example, the 'Queensland Career Information Index' was devised and produced jointly by the Youth Employment Section of the Commonwealth Department of Employment and Youth Affairs and the Guidance and Special Education Branch of the Department of Education. This index catalogues and classifies occupational information in a system that allows easy retrieval by secondary-school students.

At the school level a number of advisory committees have been formed that include members of the community. Such members do not represent any agency in which they might work but merely serve as individuals interested in the educational welfare of their community's children. These school committees or councils act in a purely advisory capacity with respect to the school's policy and curriculum and are not a formalized part of the curriculum development process. However, owing to the industrial and commercial experience and the business contacts maintained by some members, the advisory committees often play a significant role in assisting with the development of career education and work-experience programmes. Officers of the Commonwealth Employment Service and local employers are also usually involved in these programmes.

While Senior courses (years 11 and 12) are not considered to be purely technical or vocational in their scope and purposes, a number of these courses do have a greater emphasis in this regard when compared with other courses and with their equivalent Junior School courses. The subject areas that offer courses with the greatest amount of vocational emphasis are the same as those outlined in the section on integration at the first stage of the secondary level.

Mechanisms for adapting curricula

The mechanisms that exist for adapting curricula to changing circumstances are best illustrated by outlining the steps involved in the preparation, authorization and evaluation of a new course of study.

It became noticeable in the early 1970s that there was an increased retention rate of students from the first to the second stage of secondary education. As a result a need was recognized for a technical-studies subject to be offered in years 11 and 12. The following case-study details the three stages—design, development and implementation—that are involved in introducing or adapting a course of study in Queensland secondary schools.

This Department of Education initiative involved the preparation of a course of study in manual arts for students in years 11 and 12. The course has the status of a School Subject and does not lead to credit for tertiary entrance. In 1978 the course was offered in fifty state and two non-state secondary schools.

Design stage. For some time prior to 1973, Inspectors of Schools (Manual Arts), a number of principals, many manual-arts teachers and the Queensland Manual Arts Teachers' Association had been looking at the possibility of manual arts being offered either as a Board Subject or as a School Subject in years 11 and 12. They were concerned that Queensland schools were not able to offer continuity in technical studies from year 8 to year 12. The tendency for students to remain longer at school and the growing awareness of the need to educate for a technological society emphasized the need for alternative subjects that would satisfy the needs of students having a wide range of abilities, interests and aspirations.

In 1972, teachers from the Salisbury State High School carried out a survey in the adjacent industrial area to ascertain the kinds of experiences that employers considered should be included in manual arts better to prepare students to enter the work-force.

Suggested areas of experience included basic welding, advanced metal machining, advanced fitting and fabrication; sheetmetal working using machines, basic concreting and brick-laying, and basic motor mechanics.

As it was not possible to incorporate these suggested activities into existing year-10 manual arts programmes it was recommended that a manual-arts course be introduced for years 11 to 12.

In the light of the findings of the survey and with departmental approval, Salisbury State High School engaged in a pilot study that involved the preparation of a trial course of study. This was offered to students as a two-year manual arts course in 1973.

The number of schools wishing to include this course of study in their Senior School programme and problems associated with accommodation, equipment and staffing made it clear to the Inspectors of Schools (Manual Arts) that the course required departmental sponsorship and support.

In particular (a) the cost of converting and equipping a school for such a course would be considerable, and therefore expenditure on the

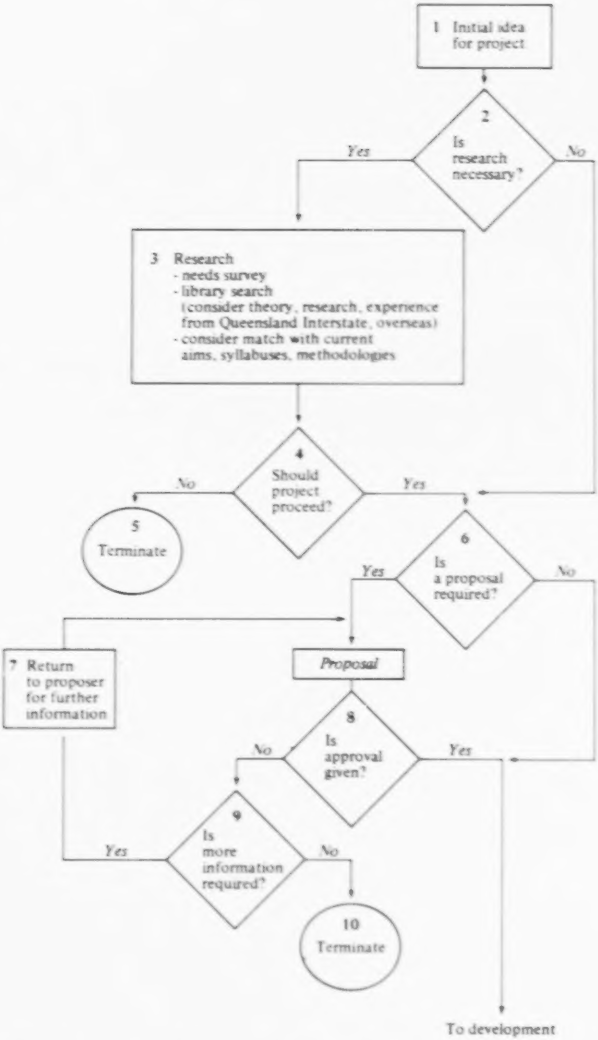

1 Initial idea for project
2 Is research necessary?
Yes
No
3 Research
- needs survey
- library search
(consider theory, research, experience from Queensland Interstate, overseas)
- consider match with current aims, syllabuses, methodologies
4 Should project proceed?
No
Yes
5 Terminate
6 Is a proposal required?
Yes
No
7 Return to proposer for further information
Proposal
8 Is approval given?
No
Yes
9 Is more information required?
Yes
No
10 Terminate
To development

FIG. 4. Design of a course of study.

purchase and maintenance of equipment and on the modification or provision of accommodation would have to be strictly controlled. The logical way to economize was through standardization and bulk purchasing. (b) Staffing would need to be carefully managed to ensure continuity of suitably experienced teachers. And (c) safety factors and safety procedures would require detailed investigation.

Information obtained from the Salisbury pilot study enabled developmental work on a revised years 11 to 12 manual-arts course to proceed to the point where, in early 1973, the Inspectors of Schools (Manual Arts) submitted a proposal to the Director-General of Education seeking approval of a Draft Rationale for the Conceptual Development of a Years 11 and 12 Curriculum in Manual Arts, a syllabus based on core areas and elective areas, and an outline of the syllabus, years 11 and 12.

The Director-General of Education granted approval and, in July 1973, the principals of larger secondary schools were invited to test the departmentally-sponsored manual-arts course for years 11 and 12 students, starting in 1974, on the following basis:

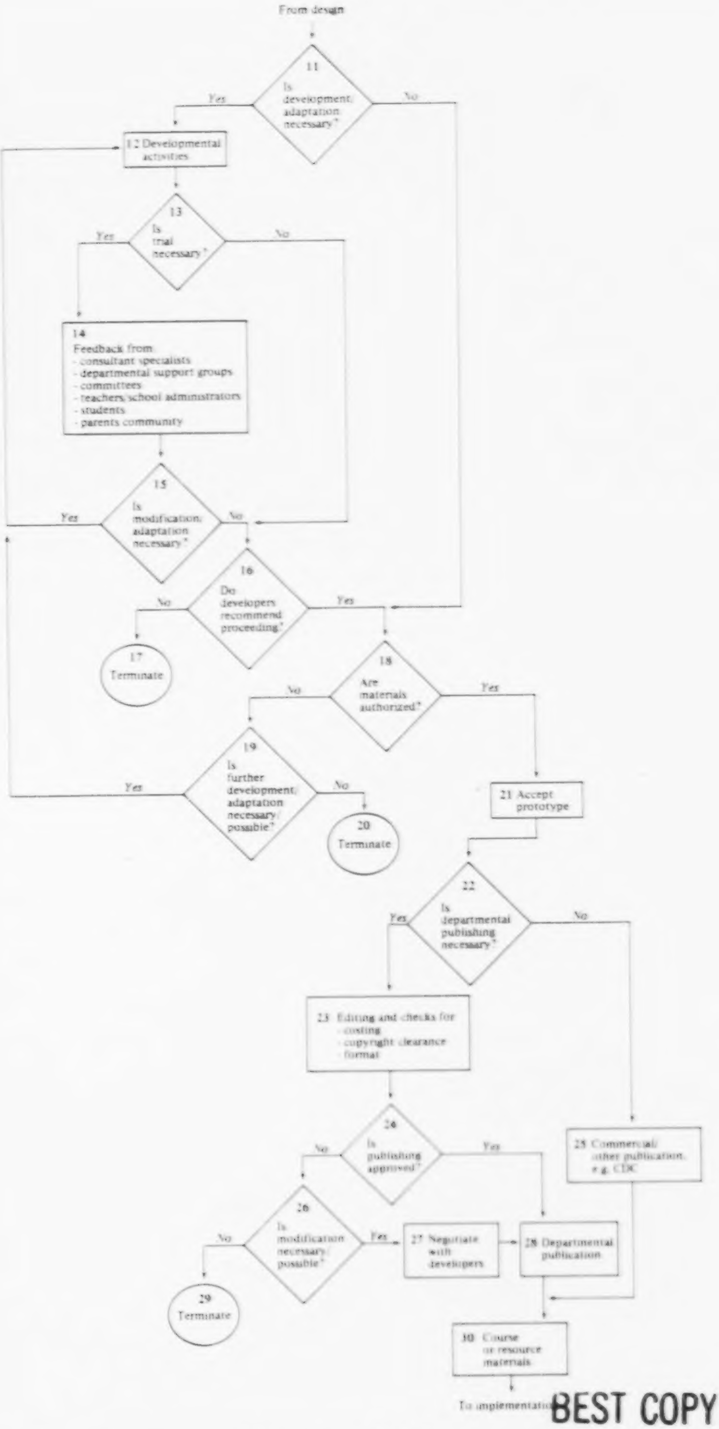
The Department would supply certain machines and allied equipment to a limited number of schools.

The number and type of machines to be installed and the extent of structural alterations were to be determined in consultation with Works Department officers, Inspectors of Schools (Manual Arts) and the teachers concerned; and a course of instruction, developed by the Inspectors of Schools (Manual Arts), was to be offered on a predominantly suggestive rather than a rigidly prescriptive basis. Schools were to include certain core areas in the course with the balance being made up of electives, taking into account the expertise available in the particular school and local needs.

Later in 1973, the Director of Secondary Education gave approval for six schools to offer the subject from the commencement of the 1974 school year. During 1974, another six schools gained approval to offer the subject.

Development stage. Early in the second term of 1974, the Inspectors of Schools (Manual Arts) organized a meeting of those involved in teaching the subject. At that and subsequent meetings, continuous evaluation was made of the course. To capitalize on the experience gained and information obtained, committees of teachers, under the direction of the Inspectors of Schools (Manual Arts), were set up to prepare a model syllabus, work modules and support material for each of six areas of study—metal machining, motor mechanics, welding, plastics, woodworking and home maintenance. The committees were made up of teachers who had volunteered to carry out the tasks mentioned above. Most of the work was done in their own time. Periodically a general meeting was held, during school time, for the purpose of co-ordinating activities, monitoring progress and evaluating material. The committee continued to function into 1976, at which stage a considerable amount of material had been prepared.

In late 1976 a manual-arts teacher was seconded to the Curriculum Branch and began the task of drafting syllabuses, work modules and


From design
11 Is development/ adaptation necessary?
Yes
No
12 Developmental activities
13 Is trial necessary?
Yes
No
14 Feedback from:
- consultant specialists
- departmental support groups
- committees
- teachers/school administrators
- students
- parents community
15 Is modification/ adaptation necessary?
Yes
No
16 Do developers recommend proceeding?
No
Yes
17 Terminate
18 Are materials authorized?
No
Yes
19 Is further development/ adaptation necessary/ possible?
Yes
No
20 Terminate
21 Accept prototype
22 Is departmental publishing necessary?
Yes
No
23 Editing and checks for
- costing
- copyright clearance
- format
24 Is publishing approved?
No
Yes
25 Commercial/ other publication, e.g. CDC
26 Is modification necessary/ possible?
No
Yes
27 Negotiate with developers
28 Departmental publication
29 Terminate
30 Course or resource materials
To implementation

BEST COPY AVAILABLE

FIG. 5. Development of a course of study.

support material for each of eight areas of study: the six mentioned above, metalworking and design education. Metalworking was not covered by the committee, as available personnel were already committed to other areas and it was felt that schools could adequately cope with any initial problems likely to be encountered in this area. Although design education is incorporated in all areas of study, it was felt that, because of its growing importance, it should also be treated as a major area of study.

The syllabus and modules follow a standard format and, except for metalworking and design education, are based on the material supplied by the committees. The syllabuses, modules and support material for metalworking and design education were researched and developed by the seconded teacher in consultation with the manual arts inspectors and other manual arts teachers. Work on this material was completed in the Curriculum Branch in mid-1977.

Funding for printing and binding was provided by the Department of Education's secondary in-service education funds together with funds from the Information and Publications and Curriculum Branches.

Printing, collating and binding of the materials were carried out by the In-service Education Section and the Curriculum Branch.

Implementation stage. In November 1977, a three-day seminar was held at the Coorparoo State High School for teachers from schools offering the School Subject manual arts, years 11 and 12, in 1978: Fifty-two schools were represented (two were non-state). The purpose of the seminar was to: introduce and disseminate syllabuses, modules of work and support material; evaluate experience gained by pilot schools; study work methods relative to new machinery and equipment; and examine testing procedures and methods of assessing achievements.

Schools wishing to implement manual arts in years 11 and 12 are required to make application to their Regional Director at least six months in advance. Applications must include a proposed syllabus and work programme and an indication that enrolments will exceed sixteen. The Regional Director forwards the applications to the Inspectors of Schools (Manual Arts), who review the proposed syllabus and work programme. Authorization to implement the course is given by the Regional Director on receipt of a recommendation from the Inspectors of Schools (Manual Arts).

Work experience

The special schools that cater for intellectually, physically and emotionally handicapped pupils have been in the field of work experience for over a decade. In Queensland there are forty-three special schools with twelve special education units for the intellectually handicapped, and five schools with twenty-three units for the physically handicapped. The

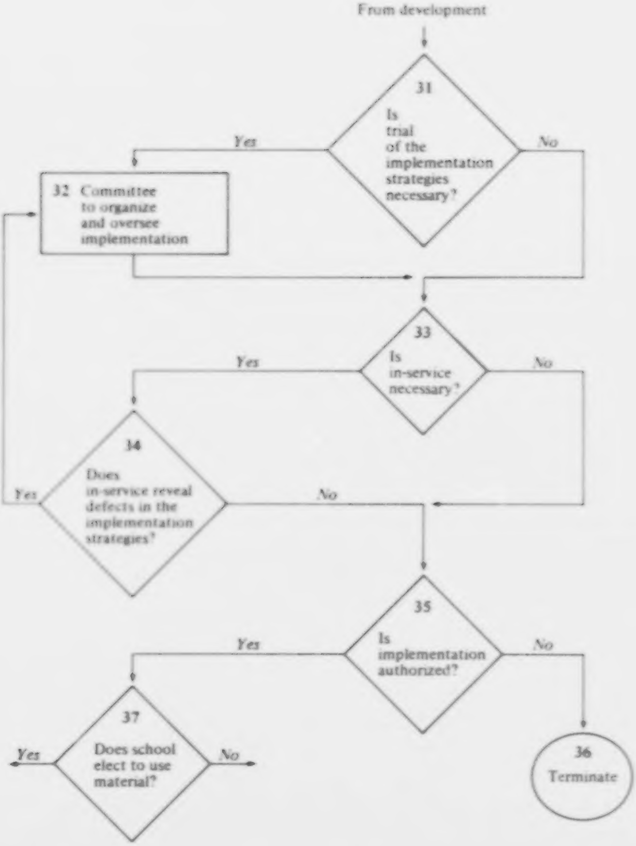

From development
31
Is trial of the implementation strategies necessary?
Yes
No
32 Committee to organize and oversee implementation
33
Is in-service necessary?
Yes
No
34
Does in-service reveal defects in the implementation strategies?
Yes
No
35
Is implementation authorized?
Yes
No
37
Does school elect to use material?
Yes
No
36
Terminate

FIG. 6. Implementation of a course of study.

majority of these have work-experience programmes, with the emphasis on vocational skills, living skills and maturity. Queensland has a pilot project called 'Work Experience—Caravan Project' designed to extend opportunities available to special students to be involved in 'real life' situations outside of the classroom. The caravan enables a small group of students, accompanied by a teacher, to undertake work experience in areas remote from the home and school. It allows the teaching of daily living skills to be combined with the preparation of students for employment, including the development of appropriate work attitudes and skills.

The first work-experience programme to be offered by a secondary school in Queensland did not begin until 1973. Subsequently another two pilot programmes commenced during 1975 and a fourth school received approval in 1977. A minor accident to a student on one of the programmes focused attention on work experience in the industrial area. As a result the Department of Education, after consultation with the state Trades and Labour Council, issued a directive that no new secondary-school programmes were to be introduced until the position regarding the legal implications had been clarified.

In April 1977 the Director-General established a widely represented Interim Work Study Committee to consider the full implications of the programmes before proceeding to the preparation of a submission to Cabinet, recommending that legislation be formed. This legislation, the Student Education (Work Experience) Act 1978 was passed on 15 December, 1978 and proclaimed on 3 December 1979.

A national survey of work experience conducted for the Schools Commission revealed that a large number of Queensland secondary schools were holding back from conducting work-experience programmes until legislation came into operation. It is now anticipated that there will be a rapid expansion in the number of secondary schools offering work experience.

In the secondary sphere, the majority of students participating in work experience have so far been from year 10. However more year 11 and 12 students are beginning to be involved as a result of the high retention rates in those years because of the unemployment problem. They are involved in the full range of occupational activities. Commonwealth government departments and certain banks do not participate. Placement is normally done by the schools, but they are assisted by other organizations such as service clubs (e.g. Rotary) and Commonwealth Employment Services.

Throughout Australia, technical and further-education colleges are providing special full-time courses with either pre-vocational or pre-trade training to facilitate entry into the work-force in certain areas. Some of these colleges also offer Education Programmes for Unemployed Youth (EPUY) from six up to twenty weeks. These courses are not concerned with vocational skills but concentrate on a minimum degree of proficiency in communications and computational skills that have been identified as basic and common to a wide range of occupations.

The Apprenticeship Board in Queensland retains the indenture system, and this is the state's most important method of training skilled craftsmen. The system aims to help students to develop manipulative skills, acquire work experience in materials, processes and the product of the field, and enhance their capacity to work productively in that field.

Up until 1964 the apprenticeship office was in the portfolio of the Minister for Education; now the department is only responsible for the technical tuition of the apprentices. Notable recent developments that effect the system in the work-study area are:

1. The reduction of technical training to three years and the attendance at college on a 'day release' basis.

2. The introduction of 'block release' in 1972 for the printing trade. This extended into other callings in later years. (In 1976, of the fifty-two trade courses, eleven were day release and forty-one were block release.)
3. The provision of subsidies to employers of apprentices to encourage indenturing.
4. Attendance by apprentices at technical colleges totally within their working time.

Both city and country centres have recognized the problems of apprentices in smaller towns, and halls of residence have been built in these centres for students from these areas who are on block release tuition.

Methods and materials

Schools, School Subject departments and classroom teachers are responsible for the translation of curriculum guidelines, issued by the Board of Secondary School Studies, into school programmes of work. Considerable emphasis is given to school-level decision-making so that appropriate learning experiences are provided for the students attending classes. While suggestions are made in the curriculum guides about materials and methodology, teacher experience and expertise, together with a range of local in-service education programmes, influence the decisions that teachers make. Support is provided to schools in various forms by the Department of Education and the Board of Secondary School Studies. These include supply of equipment, audio-visual materials, resource reviews and bulletins, source lists, publishers' names and addresses, advisory teacher services, access to film libraries, curriculum documents, video programmes, etc.

Commercial studies

In addition to those ideas and activities of the Junior School outlined in a previous section, various initiatives are currently being taken with the introduction of such specialized facilities as micro-computers and simulated business offices with associated equipment and furnishings. Greater use is also being made of facilities available in the local community for commercial and business studies. Many schools are preparing study guides for their Senior School students, especially in those areas of the curriculum necessitating specialized treatment, or in those areas where electives, options or individualized approaches are utilized.

Manual arts

Generally, manual arts for years 11 and 12 calls for some change in teaching methods, mainly because students have the opportunity to use a wide range of machinery and equipment and, as there is usually only one of each machine or item of equipment, numerous activities are taking place at any one time in the workshops.

Some teachers attempt to have as many students as possible engaged in particular activities and thereby reduce to a minimum the number of different experiences being engaged in at any time. Others attempt to have every possible experience under way at any time in order to maximise machine and equipment utilization. Methods adopted for graphics in years 11 and 12 are generally not significantly different from those used in years 9 and 10, although increased emphasis is placed on projects or assignments in order to develop and test students' initiative, research skills and design skills.

Most, if not all, schools use textbooks for years 11–12. Considerable use is made of reference material and audio-visual material.

Many schools take advantage of the technical material offered by private firms such as machinery manufacturers, mining companies, manufacturing associations, etc. Typical of the material available from those sources are: literature, wall charts, samples and audio-visual material (usually on a loan basis).

Additional machinery and equipment available for use by students in years 11 and 12 include: bandsaw, jigsaw, metal-spinning lathe, portable power planer, portable router, portable laminate trimmer, burring machine, bench grinder, guillotine, hydraulic press, belt sander, milling machine, muffle furnace, pan brake, planing machine, shaping machine, bench shears, swaging machine, electric arc welding machine, oxy-acetylene welding equipment. Schools are not necessarily equipped with every item listed.

Special provisions are made in schools offering courses in manual arts in years 11 and 12. These includes upgrading or extending accommodation and the installations of additional machinery and equipment.

Machines provided in the woodworking field are: bandsaw, jigsaw, portable jigsaw, metal spinning lathe, portable planer, and portable laminate trimmer.

Metal-working appliances, machines and tools provided for year 11 and 12 students are: bar-bending machine, burring machine, curving rolls, folding machine, bench grinder, guillotine (used under direct supervision), power hack saw, shaping machine, milling machine, pan brake, paning machine, pipe-bending machine, and swaging machine.

Welding bays are provided in schools conducting classes for years 11 and 12. Equipment for both oxy-acetylene and electric welding is provided. Spot welding machines are supplied to schools for use by students in years 10, 11 and 12.

Spray painting equipment and finishing bays are available in only a few schools for use by students in years 10, 11 and 12.

Outdoor construction courts are being provided for group projects in some schools. In some cases, welding bays and finishing areas are located in these courts. Space is available for practical work in bricklaying and concrete work. Projects may be undertaken to construct items for general school or community use.

No use is made of workshop facilities at the upper level to produce equipment for the first stage of secondary education.

Any differences between rural and urban areas in the content and implementation of curricula at the first level of secondary education apply equally to the second level.

The only additional differences that affect the second stage concern the manual-arts subject area. For example, manual arts for years 11 and 12 (a School Subject) is not available in most rural schools. In order for this subject to be implemented schools need to be assured of reasonable enrolments over a number of years in order to justify the considerable expense in establishing workshop facilities. Availability of materials in rural areas is a further problem.

Generally, the larger the school, the better the range of equipment and machines provided, simply because utilization is assured. Smaller schools tend to develop programmes around existing year 8–10 equipment and extend into areas that require relatively little expense.

Teachers, guidance and selection

The relationship between the training of general teachers and technical teachers of years 11 and 12 is the same as that outlined for teachers at the lower secondary level (years 8, 9, and 10).

The same staff, facilities and materials are available at this stage as for the first stage of secondary education. Further details of occupational guidance offered at this second stage are outlined in the following section on the transition from school to work.

In 1972, as a consequence of the Radford Report, the Senior Public Examination in Queensland was replaced by a system of internal school assessment with external moderation. Responsibility for accreditation of syllabuses and the award of Senior Certificates resides with the Board of Secondary School Studies. Students receiving the Senior Certificate are also provided with a Tertiary Entrance Score (TE Score), which is based on information supplied by the school performance on the Australian Scholastic Aptitude Test (ASAT). The order of merit resulting from this process is used for the purposes of tertiary selection.

For those students completing year 12 and receiving the Senior Certificate, entry to higher education is determined by pre-requisite subjects of particular faculties and courses, as well as by student quotas. These are laid down by the three universities and ten colleges of advanced education in Queensland, and the Queensland Tertiary Admissions

Centre (QTAC), which acts as the executive body for these institutions. Experienced Guidance Officers advise QTAC and are also available in the metropolitan, major regional and some district centres to assist students who wish to change preferences or obtain advice about how to proceed if they are not placed within the quota.

A number of tertiary institutions make provision for mature-age students to enter certain faculties without necessarily meeting the usual entry requirements. For entry purposes a mature-age student is classified as being 21 years of age or over and not in possession of a Senior Certificate. In such cases a potential student's work experience and perceived ability to cope with tertiary studies are taken into account.

Transition between school and work

The functioning of a guidance service must be seen in the context of the total educational system. While personnel working in the guidance field might perceive changed needs, when developing a guidance programme recognition is given to the needs of other groups, such as parents and teachers. Because the needs and demands of the system to which the guidance service acts as a support service are continually changing, it has been necessary to ensure that the task of defining the function of the guidance personnel is an ongoing one.

Changes are brought about in the guidance role by changing needs, in response to objectives of individual schools and changes in the level of competence of the teaching staff. There are also changes that are made as a result of new guidance approaches to persistent problems and also in response to emerging problems.

The guidance role in Queensland has moved from diagnosis and placement as the major responsibility to a situation where there is more concern with diagnosis and treatment. In addition to the academic difficulties children experience, a significant number of students have difficulty adjusting to the school setting and thus present management problems to teachers and/or parents. An increasing amount of the Guidance Officers' time is being spent in attempting to reduce the effects of environmental pressures on the child's efforts to cope with the expectations of the home, the school, and society in general. This growing concern over student adjustment in schools has resulted in guidance being broadened beyond its almost exclusive restriction to the provision of educational and vocational guidance services.

Guidance activities in Queensland secondary schools may now be grouped under the following headings: Counselling, Student appraisal, Consultant work, Information services and Co-ordination of community resources.

Vocational guidance impinges across three of these areas: counselling, information services and co-ordination of community resources.

Student counselling is a major role for the Guidance Officer, and through counselling, in individual sessions or in small groups, the student is helped to develop a better self-understanding and greater competence in occupational decision-making skills.

To make choices appropriate to further courses of study and careers, students need up-to-date and readily available information. Guidance Officers have a responsibility to maintain a supply of appropriate materials within the school and to assist in the organization of a variety of information-giving activities such as career visits, displays, visiting speakers and occupational films. A programme of talks is usually arranged for classes or special groups on matters of common interest such as courses of study available for next year, entry requirements to tertiary institutions, and various occupations, scholarship and apprenticeship schemes, and on-the-job training in government, commercial and industrial organizations.

As far as liaison with government and community organizations is concerned, Guidance Officers work together with officers of the Commonwealth Employment Service to assist students leaving school from years 10, 11 or 12 in obtaining job placements. Many Guidance Officers are now continuing this liaison beyond the students' initial job placement by conducting destination surveys of school-leavers for several years after the termination of their schooling.

In Queensland there are no specific mechanisms that provide a guided employment experience for young people at the completion of secondary education. The one exception is the Commonwealth programme for unemployed youths which is conducted at colleges of technical and further education.

A number of measures, in the form of specific projects and new mechanisms for communication, have been taken in recent years in an attempt to improve relations between schools and employment.

Employer-schools relation Project

This project is concerned with effecting an improvement in both employers' understanding of what secondary schools are attempting to achieve and secondary teachers' and administrators' understanding of employers' needs. It was initiated by the Director's Committee on Secondary Education and tried out in Brisbane and near-Brisbane areas in September 1978. The project has three phases:

An initial meeting of employer respresentatives, the Director's Committee and other departmental personnel.

A round of school 'open days' to enable employers or their representatives to visit selected secondary schools.

A meeting of employers, school representatives and members of the Director's Committee to discuss the issues raised during the school visits and to plan for future employer/school activities.

The first phase was intended to clarify the procedures used to select young employees, to work towards a mutual gain in understanding and to promote the development of action guidelines.

It was generally agreed by those participating in the trial project that much was to be gained by continued dialogue between employers and schools. Thus in 1979 phases 2 and 3 were extended to secondary schools and employers on a state-wide basis.

Research on employer expectations of school-leavers

In two recent cases, following adverse public comment on the secondary-school system and the standard of students graduating from secondary schools, the Director-General arranged for Inspectors of Schools to co-operate with employers in exploring the causes of their dissatisfaction. In the first case a sample of fifty first-year apprentices were given a test of scholastic aptitude and simple performance tests in numeracy and literacy relevant to the type of work in which they were engaged. Their scholastic records were also examined. The testing programme used was developed co-operatively by the inspectors and the employers. In the second case the employers co-operated in planning a testing programme, but withdrew before it could be implemented. In each case the exercise increased mutual awareness of the issues involved and of the different perspectives of educationists and employers. Further co-operation will be developed as a result.

Committees involving educationists and employers

There is an increasing tendency for employers to be represented on various education committees. In one educational region of the state an advisory committee, the Brisbane North Regional Education Council, has been formed with members of the local community, including employers, represented. While this committee does not have a specific brief relating to the education/employment interface, it is one of its concerns. State secondary schools are also being encouraged by the department to establish school councils with employer and parent representatives.

This practice will receive government sanction and substantial recognition if a recommendation of the Parliamentary Committee of Inquiry of Education is accepted. This committee, in its First Interim Report of December 1978, recommended that a representative of industry and a representative of commerce be appointed to the Board of Secondary School Studies.

Work-experience programmes

The development of work-experience programmes, as outlined on a previous page, is one measure that has been encouraged as a means of assisting students in the transition from school to work. Such programmes enable students to explore some of their vocational interests and help them to make a more realistic appraisal of the characteristics and demands of their preferred career or merely of the world of work in general.

No system, however, exists whereby work experience can give credit towards secondary or tertiary studies, except in the case of mature-age people seeking enrolment in certain courses related to their work. There is certainly no work-experience requirement between year 12 and the first year of tertiary education, as in some countries.

Career-education programmes

Career education has developed in Queensland not on a new subject basis, but through the provision of services to schools by Guidance Officers (since 1951) and career-information advisory teachers. Class and group talks, visits to industry, use of audio-visual resources, use of the recently produced careers kits and games are employed to give students access to adequate, up-to-date careers information. The individual student and his parents are given every opportunity of a guidance interview.

Nine career-information advisory teachers were appointed in 1977. These officers are attached to regional education offices and undertake the following school and community activities:

Student contact: Career exploration, job-finding skills, interview skills and attitude building.

Staff contact: Act as a resource for career-education programmes within the school curriculum, encourage staff involvement in career-education programmes, and assist in maintaining a Career Centre within a school.

Liaison with community—industry and commerce, service clubs, Commonwealth, Employment Service and Parent and Citizens' Association; involvement in career nights and job visits; and assistance in work-experience programmes.

The career-information advisory teachers co-operate with guidance officers in the co-ordination of career-information flow within the region and, as a team, work to support schools conducting careers programmes with school subjects. Support for these teams is provided by the careers information section of the Guidance Branch which prepares and distributes careers bulletins, guides, notes and audio-visual materials. Members of the public may also obtain these materials on request.

Link courses

The term 'link courses' has been used in Queensland to embrace various types of programmes mounted co-operatively by different institutions. The concept has been explored in depth and negotiations have been instituted between the Department of Education and the Queensland Teachers' Union to develop industrial conditions to provide for courses outside of normal school hours. Link courses involving schools and technical colleges come under this category.

In December 1978 a programme was arranged whereby twenty-eight students from Yeronga State High School were offered a ten-day programme to introduce them to a number of trades in either the building or engineering group. Students forfeited a week of what would have been holiday time to complete the second half of the two-week programme. They worked under conditions simulating those existing in industry. Almost all of the students came from year 10. While the formal evaluation of the experiment is not yet to hand, preliminary indications are that it will be judged an outstanding success.

Austria

Friedrich H. Plank

Profile of second-level education

Structure of the system

Pre-school education is non-compulsory and consists of crèches for the very young (up to 1 year), day-care centres for 1- and 2-year-olds and nursery schools for children between the ages of 3 and 6.

Nursery schools are governed by provincial legislation and are operated privately as well as by public institutions.

Special programmes and pilot projects such as pre-school classes have been and are being conducted to meet the dual purpose of promoting the child's personality and preparing for formal education.

Compulsory education in Austria covers nine years. As a rule, children begin school at the age of 6, attending primary school for four years or, if handicapped, one of the various special schools.

At the end of the fourth grade, a decision must be made as to whether the child should go on to (a) the four-grade junior secondary school (Hauptschule), Stream 1; (b) the four-grade junior secondary school (Hauptschule), Stream 2; or (c) the four-grade junior division of the pre-academic AHS (general upper-secondary grammar school).

The second key-point in decision-making arises after grade 8. Some of the pupils, mainly those from the junior secondary schools, will pass their last year of compulsory full-time schooling in the pre-vocational one-year course of the Polytechnischer Lehrgang before undertaking vocational training through an apprenticeship. This involves attending school (Berufsschule) part-time for a fixed period (up to four years), depending on the duration of the apprenticeship. The DUAL system, as it is known, terminates with the professional qualification of, e.g. the Gesselenbrief, after a final professional examination with the appropriate trade organization. Further professional courses, examination(s), as well as a specific

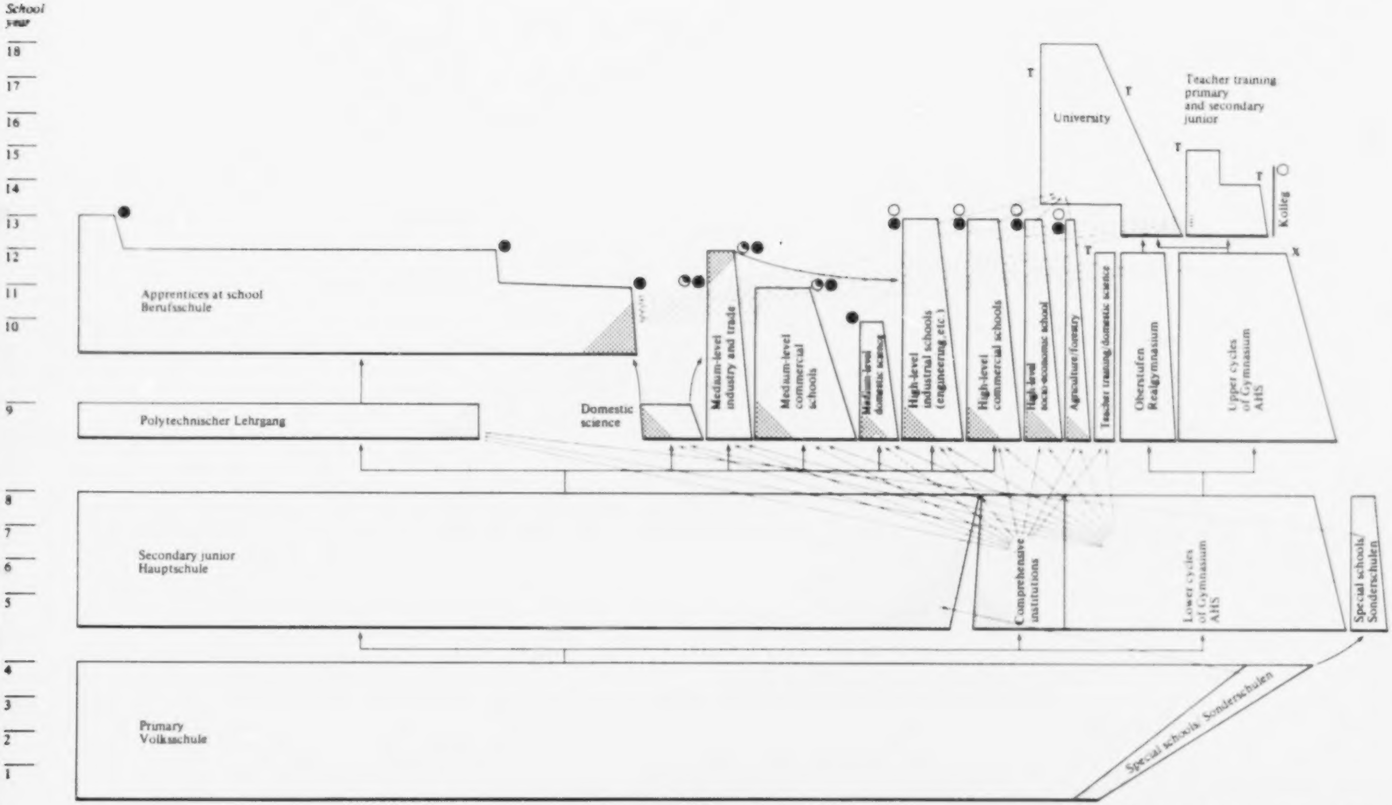

School year
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
Apprentices at school
Berufsschule
Polytechnischer Lehrgang
Domestic science
Medium-level industry and trade
Medium-level commercial schools
Medium-level domestic science
High-level industrial schools (engineering, etc.)
High-level commercial schools
High-level socio-economic school
Agriculture/forestry
Teacher training/domestic science
Oberstufen Realgymnasium
Upper cycles of Gymnasium AHS
University
Teacher training primary and secondary junior
Kolleg
T
X
Secondary junior
Hauptschule
Comprehensive institutions
Lower cycles of Gymnasium AHS
Special schools/ Sonderschulen
Primary
Volksschule
Special schools/ Sonderschulen

FIG. 1. Diagram of the Austrian national education system, with special reference to the place of technical and vocational education.

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▭	*Indicates separate categories of institutions within the education system*
◹	*Indicates presence of technical and vocational subjects within the general education curriculum*
◥	*Indicates comprehensive institutions*
▨	*Indicates institutions exclusively for technical and vocational education*
⬚	*Indicates institutions for technical and vocational education outside the formal education system*
→	*Indicates normal routes through the system*
⇢	*Indicates second or unusual routes through the system*
◑	*Indicates examinations required to obtain recognition of successful completion of one level of education before proceeding to the next level*
○	*Engineering or professional qualification*
◔	*Technician or middle-level qualification*
●	*Skilled worker or craftsman qualification*
T	*Teacher qualification*
X	*No qualification*

Key to Figure 1.

period in the trade may lead to the qualification of Meister, which enables the applicant to open up a business in the sector concerned and to take on and train apprentices himself.

Since nine years' schooling is the legal condition for admittance to a career involving apprenticeship, not all pupils in this field attend the Polytechnischer Lehrgang. Some are AHS pupils who opt out of their schools at the age of 15 or later, and some are drop-outs of the technical and vocational full-time schools.

An alternative route towards professional qualification for pupils at grade 9 is through the technical and vocational medium- and high-level schools, which offer programmes of up to five years and lead to (in some cases several) professional qualifications of the type gained in the DUAL system. In addition to these professional qualifications, the high-level schools qualify their students for proceeding to university studies, on the one hand, or for entering an assured career in an industrial, commercial, agricultural, or socio-economical occupation, on the other—openings that result from passing the Matura examination.

After another three years' work in the relevant occupation, graduates of the engineering, agricultural and some industrial craft studies in high-level schools are awarded the professional title Ingenieur. Classes are furthermore available in the AHS senior forms and are, of course, open to the AHS-juniors who want to stay on in their schools, in particular when a decision has been made in favour of academic post-secondary further education.

There are four prime AHS categories, three of which are eight-year schools. The fourth is an independent four-year upper-cycle school, the Oberstufenrealgymnasium, whose purpose is to provide AHS education as a continuation programme for Hauptschule-leavers.

All AHS programmes terminate in the Matura, the final examination, success in which carries the right of admission to university. An academic course of university study, attendance at a Kolleg (a quasi-postsecondary vocational course of up to two and a half years, carrying qualifications identical with the high-level vocational schools) or at other vocational institutions (e.g. teacher-training courses) are open to anyone who has obtained the Matura final-examination qualification.

Adult education is gaining increased attention in Austria. Evening classes using approved syllabuses are available at the level of the engineering, commercial and AHS 'grammar' schools and lead to equivalent qualifications. They are designed for students over 17 years of age who have already entered a profession.

A set of medium-level syllabuses for engineering studies was published in 1979. Adults who have completed these programmes qualify as Werkmeister, a position in industry similar to the Meister qualification mentioned earlier which entitles them to train apprentices.

Secondary-level enrolment

A very low percentage of the age-group under discussion attends neither the Hauptschule nor AHS, but continues in the Volksschule (senior division). In 1979 such students numbered only about 2,000. This situation is due to the geographical isolation of some areas, where secondary education can be provided only in this particular form.

Handicapped children are cared for in special schools, with class sizes varying from 10 to 18, depending on the type of handicap. The vast majority of pupils enter secondary education (almost 100 per cent), and a decision is made at that stage by the primary-school teachers concerned (i.e. the fourth-grade teachers) as to which children have the ability and aptitude for the 'upper stream' of the Hauptschule and which should enter the 'lower stream'.

Those pupils considered to possess upper-stream ability may enrol in either the first stream of the Hauptschule (in 1978, 40 per cent of all pupils; 44 per cent of the girls) or the junior cycle of the AHS (in 1978, 22 per cent of all pupils; 22 per cent of the girls), this decision being left to the parents.

Children deemed to lack upper-stream ability enter the Hauptschule second stream (in 1978, 27 per cent of all pupils; 24 per cent of the girls) although they may sit for an entrance examination if the parents feel their child should enter the first stream or the AHS.

After grade 8 (fourth year of secondary education) the scope of second-stage education comprises a broad variety of vocational programmes as well as a number of pre-academic courses.

Entry into the upper cycle of the AHS is subject to successful completion of an AHS fourth grade or adequate performance at a Hauptschule. In 1978 a total of 20 per cent of the age-group under discussion entered grade 9 of the AHS (20 per cent of the girls).

In most areas of full-time second-stage technical education, enrolment depends on the student's performance in aptitude tests, which also determine admission to either the high-level or medium-level variety of the programme. In 1978, enrolment in grade 9 of full-time technical and vocational education (medium- and high-level) was as follows: agricultural and related schools, 6 per cent of all pupils, 6 per cent of the girls; commercial schools, 18 per cent of all pupils, 21 per cent of the girls; engineering and related technical schools, including some specializing in arts and crafts, 10 per cent of all pupils, 2 per cent of the girls; socioeconomic schools, 13 per cent of all pupils, 24 per cent of the girls.

An alternative choice after grade 8 is the Polytechnischer Lehrgang, which offers a grade-9 year of pre-vocational training; admission is possible after eight years at school. In 1978, this option was chosen by 36 per cent of all pupils (by 28 per cent of the girls).

Education in the form of apprenticeship starts at grade 10, and admission does not depend on examinations. Enrolment in the accompanying part-time compulsory school education is geared to a contract with an employer qualified to conduct the training of apprentices. In 1978 some 50 per cent (35 per cent of the girls) in the relevant age bracket took up apprenticeships.

University, post-secondary and quasi post-secondary programmes (e.g. Kolleg courses) are available to graduates from high-level pre-academic schools of both the grammar-school and technical variety. In 1978, 51 per cent of these 'Maturanten' (46 per cent of the female 'Maturanten'), high-level school graduates, followed third-level programmes.

Student-teacher ratios are available for the following: Hauptschule, 14 : 1; Berufsschule, 10 : 1 (an estimate); AHS (first and second levels), 14 : 1; medium- and high-level technical and vocational schools (where there is a higher proportion of part-time teachers): engineering and related studies, 9 : 1; commerce, 14.5 : 1; socio-economics (e.g. domestic science), 11 : 1. Classes are further split up between certain subjects (e.g. languages, workshop practice) and here student-teacher ratios are much lower.

Administration

Austria's educational system is based on the Constitutional Act of 1962, which governs the distribution of powers between the central government, the federal provinces, and the constituent districts in the field of non-university education. While pre-school education (kindergarten) is within the competence and jurisdiction of the local authorities, primary and 'compulsory' first-cycle secondary (non-AHS) schools are administered via a hierarchy of bodies starting with local councils and educational offices (i.e. Bezirksschulrat) at grass-roots level, provincial authorities and their educational agencies (i.e. Landesschulrat) at intermediate level, and the Ministry of Education and Arts at the highest level. AHS schools, on the other hand, are administered by the provincial authorities at the lowest level and this also applies to the medium- and high-level technical vocational schools.

Thus, questions of staff and inspection in this chain of authority are the responsibility of the local and provincial educational bodies (e.g. in respect of Volksschulen and Hauptschulen), while in curricular matters the central authority has the ultimate responsibility, with the federal and local authorities acting as the administrative arm.

This latter principle also applies to the AHS and to the technical full-time schools, where responsibility is shared between the federal and central administration, leaving curricular design (for example) to the

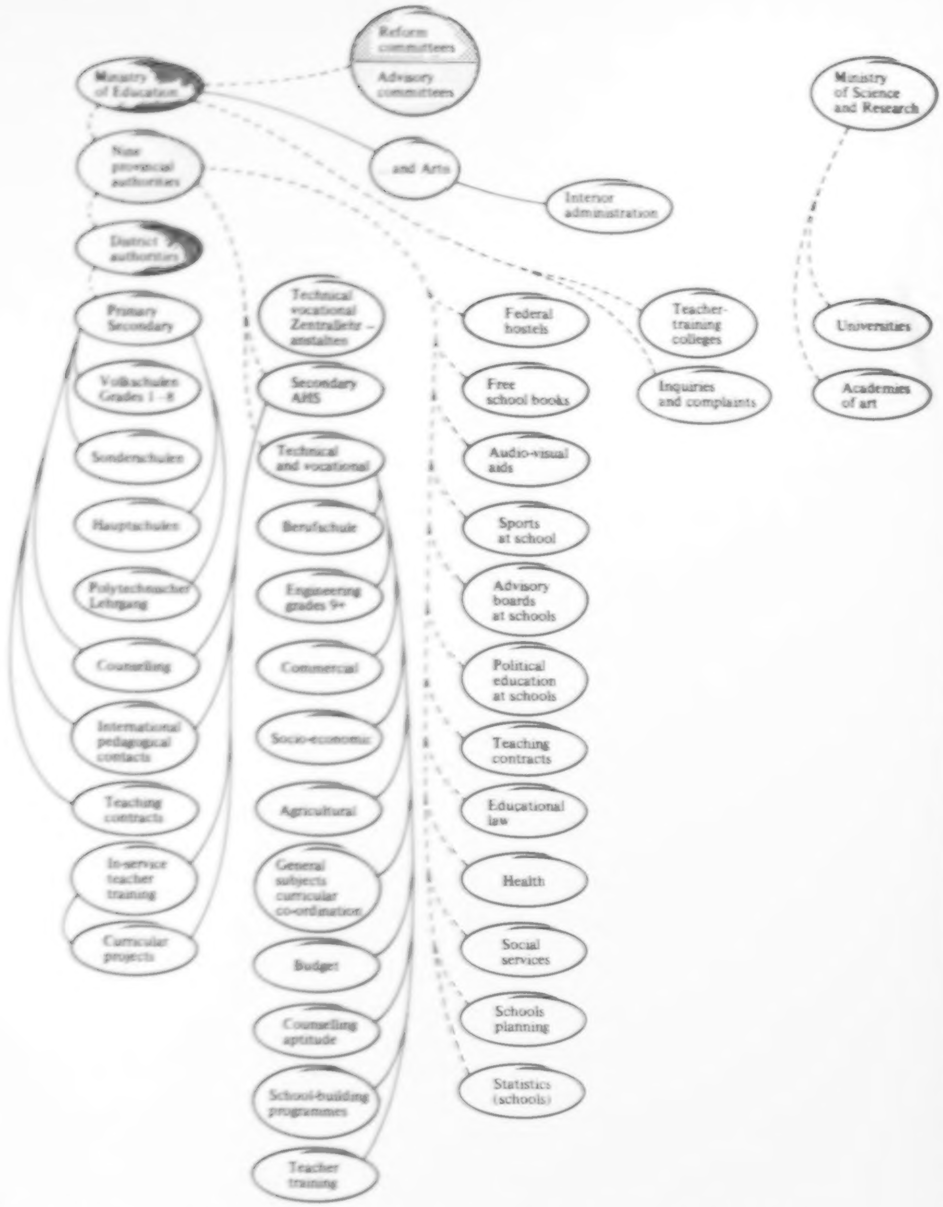
Reform committees
Advisory committees
Ministry of Education
Nine provincial authorities
... and Arts
Interior administration
District authorities
Primary Secondary
Volksschulen Grades 1–8
Sonderschulen
Hauptschulen
Polytechnischer Lehrgang
Counselling
International pedagogical contacts
Teaching contracts
In-service teacher training
Curricular projects
Technical vocational Zentrallehr – anstalten
Secondary AHS
Technical and vocational
Berufschule
Engineering grades 9+
Commercial
Socio-economic
Agricultural
General subjects curricular co-ordination
Budget
Counselling aptitude
School-building programmes
Teacher training
Federal hostels
Free school books
Audio-visual aids
Sports at school
Advisory boards at schools
Political education at schools
Teaching contracts
Educational law
Health
Social services
Schools planning
Statistics (schools)
Teacher-training colleges
Inquiries and complaints
Ministry of Science and Research
Universities
Academies of art

FIG. 2. Diagram of the administrative structure of the Austrian education system.

ministry, while allocating enforcement and certain powers of interpretation to the provincial authorities.

In this educational bracket one and the same person—e.g. the Inspector for the Federal Province of Lower Austria in respect of medium- and high-level schools of engineering and related studies—is part of the state hierarchy and enforces central decisions, and is simultaneously responsible to his Federal Provincial Government, which holds certain powers as regards provincial legislation and decision-making. When it comes to this area of decision-making his ultimate superior in the matter is not the Federal Minister but his Provincial Governor, who in turn is both part of the state hierarchy and, in certain fields, responsible to his Provincial Government and electorate.

A small number of schools are directly controlled by the Ministry of Education and Arts, without provincial bodies being involved. This, however, does not exempt such establishments from the obligations of comparable schools, such as teaching along the lines of the public syllabus or employing adequately qualified staff.

On the whole, the structure of the local, provincial and central educational administration reflects school categories. Thus, inspectors are appointed for a particular category of schools, and their area of responsibility covers either a constitutional district (e.g. Bezirksschulinspektor für Pflichtschulen) or extends as far as the federal province (Landesschulinspektor für Handelsschulen und Handelsakademien für Oberösterreich). In some cases, when the number of schools in a particular category within a province is particularly low, an inspector may be appointed for more than one province.

The Ministry of Education and Arts, then, consists of sections and departments. Two of the sections, each headed by a director-general, who is directly responsible to the minister, deal with the pedagogical affairs of all publicly recognized primary and secondary schools in Austria. Section I covers the field of primary and secondary lower-cycle education plus the AHS senior cycle (i.e. general education), whereas Section II deals with the affairs of vocational schools (upper secondary cycles).

The individual departments, which reflect the categories of specialization of educational programmes, are each headed by a director, who is responsible to his director-general and are in charge of curricular developments as well as administrative activities, including those involving other ministries. Thus, for example, professional qualifications of technical-school graduates are subject to negotiations between the Ministry of Education and Arts and the Ministry of Trade and Industry, which holds certain powers in the industrial training of apprentices and in licensing. The Ministry of Education and Arts must pay attention to the individual (but standardized) training programmes in industry and commerce in order to ascertain the standard of professional training required in its own field.

Institutions that were recently involved in drawing up medium-level upper-secondary curricula are the Chamber of Commerce and its affiliated institutes for the promotion of commerce as well as the Chamber of Labour and its affiliated institutes for professional promotion, all of which had been running industrial and engineering courses (e.g. Werkmeisterkurse). Under the guidance of the Ministry of Education and Arts a consensus between the individual parties was reached, so that in 1979 a new set of curricula was published by the ministry, institutionalizing this particular aspect of adult education.

On the whole, whenever the ministry intends to publish curricular legislation, all relevant representative boards (e.g. the social partners, the family association, etc.) are involved at least in the final stage, when comments are invited that often lead to amendments of the original draft.

While final examinations (Reifeprüfung = Matura, Abschlussprüfung) as well as non-university teacher training still come under the Ministry of Education and Arts and its subordinate institutions, university education and research are the domain of the Ministry of Science and Research, although universities enjoy a relatively high degree of autonomy with regard to running their own affairs. Teacher training at university level likewise comes under the Ministry of Science and Research and requires contact between the two Educational Offices.

Financial situation

Because of the structure of the educational system, the budget of the Ministry of Education and Arts does not reflect total national expenditure on education, since, for example, manpower expenditure for compulsory schools (the AHS junior cycles cannot be counted as 'compulsory' schools), including the compulsory day- or block-release schools for apprentices, are budgeted within the figures of the individual federal provinces. A large proportion of the total expenditure is not therefore shown in the national budget of the ministry, and percentage of expenditure for individual types of schools will be distorted if related to that budget. When, in addition, it is borne in mind that (to cite one example) the upper-cycle schools for agriculture and forestry are partly financed by the relevant ministry rather than the Ministry of Education and Arts, we arrive at a 1979 figure of just under 7 per cent of the ministry's budget for the upper secondary medium- and high-level vocational schools, leaving aside costs in respect of apprentices' school education. The allocation of resources to the full-time technical schools, and in particular to the schools of engineering, is shown to strongly favour these establishments, because the population of such schools rose sharply in the 1970s and investment in these schools has received priority attention from the present government and its predecessors for the last decade or so.

The following cost-per-student figures for general and technical education should be seen in light of the fact that equipment costs in industry and business have rocketed during the same period and that modern machinery and technologies cannot be ignored in a field where changes occur at such speed. The figures represent cost/student/year in Austrian schillings (AS15 = $1):

Berufsschule	10 000
Handelsschule and Handelsakademie	22 000
Höhere and mittlere technische Lehranstalt	47 000

Policy of secondary education: its formulation and trends

The various types of school programmes are laid down in categories (according to names, level, grades, and educational purpose) in the Schools Organization Act of 1962 and its six subsequent amendments.

At the same time, this Act institutionalizes the possibility of carrying out pilot programmes designed to adapt the system to changing socio-economic requirements. Such pilot programmes in the field of secondary education have consisted of experimenting with the comprehensive school in the lower secondary cycle, a new form of the Polytechnischer Jahrgang (the grade-9 pre-vocational course), new methods in the field of the apprentices' education at school, and a series of programmes in the technical schools. The decision as to whether or not pilot programmes can be institutionalized is, however, a political one, since amendments to the Schools Organization Act require a two-thirds majority in Parliament and pilot programmes come to an end after a specified time.

Technical vocational education does not begin before grade 9 except in the case of the special schools for the handicapped, where some technical and trade instruction is provided. The technical education in grades 5 to 8 is elementary in character and comprises vocational craft programmes and shorthand and typing, which are offered as optional subjects.

While day- and block-release education for apprentices will continue because of its popularity with all groups concerned, increased attention has been focused on the technical schools as a result of the government's effort to provide access to higher education for all children and encourage pupils and parents to make use of this offer; and to tackle problems connected with the economic infrastructure of the country in the field of education by offering attractive technical programmes in modern and adequately equipped schools throughout the country.

Kollegs and related programmes count as secondary-education cycles in Austria and are still in the pilot-programme stage. They are designed to cover specialized subjects in those technical areas that were not included in the Matura already taken. Since they have measured up to expectations, institutionalization is expected to take place soon.

Emphasis has likewise been laid on adult education, and a series of programmes is designed to offer courses to skilled and non-skilled workers. Some of these programmes lead up to the Matura level. The technical education courses are available in evening classes and cover the commercial and engineering areas.

The foundation of all educational legislation in Austria is the Constitutional Act of 1962, which defines the powers of the federal and provincial authorities, distinguishes between private and state schools, and governs the composition and function of the provincial school boards.

Educational acts based on the Constitution concern, *inter alia*, school organization, school inspection, compulsory schooling, private schools, and school maintenance, all made effective in 1962. Subsequent acts have dealt with school timetables, agricultural education, nursing education, study promotion, grants to pupils, free transport, free textbooks, apprenticeships, school instruction, adult education, terms of employment for teachers, as well as with university education where it relates to the schools.

Another level of legislation—in the form of ministerial decrees—covers the publication of national curricula as well as the issuing of interpretative documents on existing parliamentary acts and ministerial orders. These decrees are either published in the official periodical (if they apply to the whole of the country) or are issued to specific authorities or individuals. Decrees of national significance (e.g. curricula) are generally subject to comment from a number of public or private organizations before publication and are often amended as a result.

Educational legislation is also carried out at the level of the provincial parliaments for those areas for which the 1962 Constitutional Act makes them responsible.

Changes and prospects

Some changes have taken place in the 1970s, although they have not been of major significance.

The budget of the Ministry of Education and Arts has been raised at a rate higher than that of the National Budget, a fact that reflects the priority attention given to education in a time of economic difficulty.

The number of pupils attending an upper cycle of the Volksschule (elementary school) has been reduced to an absolute minimum, and where such courses have to be conducted because of a particular area's inaccessibility, supporting pedagogical measures are undertaken.

The provision of free transport to and from school and of free schoolbooks for all pupils has obviously encouraged the population to make use of the more academically-oriented programmes and, in particular, of the technical and vocational schools.

Technical schools have been receiving priority attention from the government, and the number of students in technical education has significantly increased.

Under the Schools Development Programme, a ratio of 1 : 1 : 1 has been set for pupils enrolled in pre-academic, high-level technical and medium-level technical programmes, with particular attention being given to the provision of educational facilities for rural areas and other areas having relatively poor infrastructures.

Owing to the unforeseen success of the upper secondary AHS type of Musisch-Pädagogisches Realgymnasium, which had originally been designed to provide recruits for the teacher-training academies but turned out to be an alternative route towards Matura qualification (starting from Hauptschule levle), this programme has been broadened by the addition of specialized courses in mathematics and natural science and has been renamed and accepted as a standard Programme (Oberstufenrealgymnasium).

Elementary technical education has been introduced in the lower secondary cycles and has been included in the respective national syllabuses.

Adult education leading to technical qualifications has been expanded and is currently receiving a great deal of attention from institutions representing both employers and employees as well as from the educational authorities.

Through the institution and assessment of pilot programmes, trends in education have been determined and alternatives to the present structures and programmes have been devised.

To institutionalize alternative structures and programmes that have proved successful in pilot studies, an amendment of the Schools Organization Act is required (the sixth of its kind), but it is not yet possible to predict what amendments will be realized.

Major issues

Various investigations into the number of university entrants or the needs of industry for medium-level personnel have been carried out during recent years and suggest that the ratio of 1 : 1 : 1 between pre-academic secondary schools and medium- and high-level vocational schools does in fact reflect manpower requirements.

While this ratio appears to be sufficiently realistic, the resulting policy cannot be final and needs constant revision to avoid rigidity. Allocation of manpower resources in accordance with this ratio is realized through counselling and the provision of information to both parents and children. Thus officers of the labour-market administration provide counselling both at grade 8 and grade 11, while specially trained and appointed teachers are permanently available for educational and psychological counselling.

The triple training provided at high-level schools (training of skilled labour and high-grade technicians, and preparation for university) as well as the double training in the medium-level schools (skilled labour and technicians) are believed to guarantee a very high degree of versatility and adaptability of the school-leavers. Pilot programmes in new lines of study in technical education also ensure that manpower requirements can be met in a relatively short time—e.g. in the textile industry, which has been undergoing rapid structural changes.

Through boards attached to individual technical schools (Kuratorium) and representing the relevant sector of industry, through direct contacts between industry and the educational authorities and through comments from industry in the final stage of curriculum-drafting (before a syllabus becomes effective), industry enjoys a very high measure of influence in the vocational education system.

On the other hand, a common core of technical subjects in the individual curricula ensures that specialization in one particular industrial field does not exclude the trainee from entering other related fields.

Since the present political scene in Austria is characterized by a vigorous effort to restructure the economy, increased attention has been given to adult education, and in particular to adult technical education.

A system of adult technical education in the form of evening classes is now operative; to a considerable extent this is geared to secondary education and makes use of the trainee's acquired skills. Programmes in this area lead to practically the same qualifications as their day-school equivalents.

Owing to the continuing growth of the Austrian economy, the number of unemployed has not reached the level experienced by other European nations, standing at 2 per cent in 1980. Consequently youth unemployment is not a serious problem at the moment, although admittedly the choice of occupation may be restricted in some areas.

The number of school drop-outs within the upper cycle of secondary education and in particular in technical education may cause some concern, but it must be borne in mind that compulsory education ends at grade 9, which also coincides with the first year of medium- and high-level technical and vocational full-time schools, whose demand on the pupils' time and concentration is high. School drop-outs at this stage and later in their careers generally opt for the apprentice's DUAL education, where they may receive credits depending on their previous line of study.

Lastly, a system of 'external' examinations has been devised for people not attending regular courses, leading to qualifications similar to those achieved through school attendance. These examinations are carried out under the auspices of especially appointed commissions.

Educational certification is an institutionalized area of legislation. There has been a growing public awareness of the need for qualifications expressed through certification, which coincides with the government's objective of increasing the professional competence of the individual.

Socially underprivileged sectors of the population have been encouraged to implement their increasing interest in education by means of supportive educational legislation as regards free school attendance, free schoolbooks, free transport to and from school, and a system of scholarships.

Handicapped children receive specialized education aimed at their integration into society and industry. Current policy is to provide separate facilities where necessary and integration into existing 'normal' programmes where possible.

Children of migrant workers have special syllabuses devised in co-operation with their respective countries; textbooks are imported from their native countries and foreign teachers are recruited with the assistance of the embassies concerned.

By legally defining the role of pupils, parents and teachers with respect to rights and duties and by institutionalizing the right of appeal against decisions involving essential rights of pupils and their parents on two administrative levels (appeals against decisions at school level can be made first to the provincial authorities and subsequently to the Ministry of Education and Arts), the School Instruction Law (SchUG) has made a significant step towards democratization.

Provision has also been made to improve the opportunities available to non-German-speaking pupils who nevertheless know German sufficiently well to take part in the teaching and assessment process. They can now attend standard programmes and German is assessed as the 'foreign language', while their own language, if taught as part of the programme, counts as the native tongue.

In principle boys and girls have access to the same educational programmes except that there is no co-education in physical education. Certain technical programmes, however, are still dominated by one or the other sex (e.g. home economics by girls, mechanical engineering by boys). The public tends to be somewhat conservative as to what constitutes a 'female' or 'male' profession, and changes in this attitude are not expected to occur in the near future.

The system of examinations as laid down by law is based on continuous assessment. Examinations outside the classroom take place in cases of reassessment, e.g. when an appeal is made against a decision that a pupil's performance does not justify his transition to the next class, or that the conditions of enrolment (e.g. 'good' overall results in Stream 1 of the Hauptschule for admission to the AHS upper cycle) are not met.

Formal examinations are also held at the end of the AHS cycles, the technical and vocational high-level programmes (Matura = Reifeprüfung) and at the end of some medium-level programmes (Abschlussprüfung). A credit system is operative in so far as areas of instruction, knowledge of which has been assessed in a public certificate, are credited towards programmes that comprise identical curricular areas at the same level.

In the area of technical education, a curricular project for devising and illustrating detailed teaching objectives (Lehrzielbank) for individual subjects was begun about a decade ago. Results (in the form of publications available to all subject teachers) are used to support teachers in determining essential areas of teaching, to offer manageable teaching elements in a structured way and to help the teacher in his diagnostic function thereby facilitating objective testing.

Integration strategy

Strategies of reform are specified in educational legislation (the School Organization Act 'SchOG'), one of whose provisions allows for a certain percentage of pilot-programme schools, provided planning, purpose and procedures are approved by the ministry. These programmes must be requested by the provincial education boards, and results in relation to the original planning are assessed and published by the ministry after discussions with the Federal Chamber of Commerce and the Chamber of Labour.

Pilot programmes on the integration of vocational and general subjects are currently under way in the pre-vocational year (Polytechnischer Lehrgang). Pilot programmes with respect to integration are also under way in the part-time compulsory vocational schools (DUAL education), where suitable pupils are given the opportunity of receiving additional education, in the technical schools for the physically handicapped, and in an upper cycle of AHS, where additional training in a metallurgical craft is available.

Integration at the first stage of the secondary level

The first stage of second-level education begins at grade 5 and covers 4 or 5 years at school. The age bracket is 10–14/15 years. Institutions available are the following:

Volksschule: upper classes of a few elementary schools, attendance at which is now permitted only where no junior secondary schools are available.

Hauptschule: whenever possible, junior secondary schools are organized in two streams at different academic levels, characterized by a different balance within the set of subjects and by the fact a modern language is taken in Stream 1.

AHS (Gymnasium, Realgymnasium): the lower cycles of the pre-academic secondary schools, whose compulsory subjects (thirty-three lessons a week) are almost identical in the first two grades but then vary slightly. (Latin or descriptive geometry are included depending on the programme.) There are optional subjects and a certain amount of extra-instruction may be given to transferees and under-achievers. The Hauptschule and AHS syllabuses are very similar in content, a fact which reflects the aim of facilitating transfer to the AHS programmes.

Sonderschule: the upper grades of the special schools for the handicapped.

Comprehensive programmes as tested in pilot schemes: these involve no more than 10 per cent of the schools but with no change in curricula, others are based on an integrated concept in one of three forms, based on setting, on combined streaming and setting, and on an orientation cycle, respectively.

Polytechnischer Lehrgang: strictly speaking this programme is not first-stage secondary level; it is a year of pre-vocational training for those who do not plan to attend an upper-cycle secondary technical vocational programme full-time. Since full-time compulsory education terminates after nine years at school, not all pupils reach a grade-9 institution or the pre-vocational course, owing to the nature of selection carried out in the standard (non-pilot) programmes.

Selection in the individual subjects is carried out through a marking system (standards 1 to 5, '1' being the top and '5' a fail mark) applied to written, oral and practical work. The number, duration and nature of the test papers is determined by the curriculum, while the organization of oral, practical and written examination work is laid down in the School Instruction Act. In all marking emphasis is laid on continuous assessment. Pupils are expected to achieve passes in all compulsory subjects of their particular programme before passing on to the next grade. Provision has been made, however, to allow for transition to the next grade despite one failed subject if the teachers concerned collectively decide that performance in the other subjects is satisfactory and further progress is likely. One or two failures at the end of a grade are subject to reassessment at the end of the two-month summer vacation, an opportunity that is generally made use of.

The pilot programmes in the lower secondary cycle mentioned above, involving setting in three subjects (maths, German, foreign language), have shown that progress through the individual grades has been markedly encouraged and resulted in a much higher proportion of pupils being able to take full advantage of the compulsory school programme. These findings are of great significance in so far as the quota of the relevant age-group transferring from less academic to more academic programmes has not been satisfactory, and it is hoped that the situation will improve if the programmes are eventually institutionalized.

Curricula

Except in the case of the pre-vocational Polytechnischer Lehrgang and the special schools, curricula do not include strictly vocational subjects, although 'vocational crafts' for boys and girls are certainly at least pre-vocational in character, while shorthand as a compulsory subject in the Hauptschule and shorthand and typing as options in the Realgymnasium have a direct bearing on professional qualifications.

Options are explicitly stated in the respective syllabuses along with the core of compulsory subjects. The number of options available to the individual pupil will, however, depend on his or her own capacity, on the facilities of the individual school, and on the particular arrangement of the timetable.

While vocational crafts are still offered in the form of separate programmes for boys and girls at this level, the boys' subject is available as an option to the girls and vice versa.

General and technical and vocational subjects

The relation of general and technical subjects is not explicitly mentioned in the individual curricula at this level, although 'concentration' (a didactic principle of the Hauptschule curriculum) allows for a combination of individual subject contents where possible, and requires co-ordination of the form teachers with respect to curricular integration.

One of the didactic principles of the AHS curriculum is commercial education, primarily the subject Commercial Studies. At school level this requires the necessary co-ordination between this particular subject and any other related subject.

The programme of the pre-vocational Polytechnischer Lehrgang is laid down in the national curriculum, but is determined to some extent by the provincial authorities and is thus adaptable to local manpower and educational demands. This programme is geared to future professional careers, as reflected in the scope and nature of subjects and the marked integration of general and technical contents in the curriculum, where

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TABLE 1. Curriculum outline. School type: Polytechnischer Lehrgang. Level/grade: pre-vocational/9

Subject group	Subject areas	Periods weekly, one year		
		Classroom	Workshop	Percentage
	Religious instruction	2		
General	German	6		31.5
	P.E.	3		
Pre-vocational general	The individual and society	2–3		
	Socio-economics	2–3		
	Industry and environment	2–3		
	Health care	1		
	Industry and labour	2–3		31.5
Basic science	Mathematics	6		17
General technical	Technical drawing	2 (boys) 1 (girls)		
	Vocational crafts		2–4 (boys) 2 (girls)	
	Domestic science and nursing for girls		4	20
	Options:			
	Shorthand	(2)		
	Typing		(2)	
	Total class periods	30 (boys) 29 (girls)		
	Total workshop periods		3 (boys) 6 (girls)	
	Grand total per week: boys, 33 girls, 35			

even general education is oriented towards practical life. Girls and boys follow separate programmes oriented towards their future roles in society.

In the Hauptschule and AHS the subject 'vocational crafts' is not strictly technical or vocational, as it aims at improving pupils' technical understanding, their imagination, their planning ability and their critical attitudes. Producing technical drawings as well as developing skills in handling and using tools form a substantial proportion of the activities involved. The subject embodies both practical and theoretical work and is supplemented by industrial excursions. Workshops are provided with

Table 2. Curriculum outline. School type: Hauptschule, Stream 1. Level: secondary junior.

Subject group	Subjects	Periods weekly													
		1st year			2nd year			3rd year			4th year				
		Class.	Lab.	Wsh.	Class.	Lab.	Wsh.	Class.	Lab.	Wsh.	Class.	Lab.	Wsh.	Total	%
General	Religious instruction	2			2			2			2			8	
	German	5			5			4			4			18	
	Foreign language	5			4			3			3			15	
	History, social studies	1			2			2			2			7	
	Geography, commercial studies	2			2			2			2			8	
	Musical education	2			2			1			1			6	
	Artistic crafts	2			2			2			2			8	
	P. E.	3			3			3			3			12	63.6
Basic science	Mathematics	5			4			4			4			17	
	Biology	2			2			2			2			8	
	Physics, chemistry					2			3			3		8	
	Descriptive geometry							2			2			4	28.7
General technical	Vocational crafts, boys			2			2			2			2	8	
	Vocational crafts, girls			2			2			2			2	8	
	Shorthand										2			2	7.7
Selection of general technical options	Supplementary crafts for boys and girls			(2)			(2)			(2)			(2)	(8)	
	Domestic science for boys and girls									(2)			(2)	(4)	
	Typing												(2)	(2)	
	Vocational information (one period/ week for pupils in their 9th year)													(1)	

TABLE 2 (*continued*)

Subject group	Subjects	Periods weekly													
		1st year			2nd year			3rd year			4th year				
		Class.	Lab.	Wsh.	Class.	Lab.	Wsh.	Class.	Lab.	Wsh.	Class.	Lab.	Wsh.	Total	%
	Total number of options: 13 Remedial teaching in German, foreign languages, maths														
	Total classroom periods	29			28			27			29				
	Total lab periods					2			3			3			
	Total workshop periods			2			2			2			2		
	Total practice	2			4			5			5				
	Grand total per week	31			32			32			34			129	

the required tools and simple machinery. While the objectives for boys and girls do not differ significantly, the subject-matter of the respective syllabuses does. Boys are required to cover fields such as building, housing, environmental arrangements, dealing with items such as elementary mechanics and design, whereas girls specialize in domestic activities such as clothes, fashion, and design.

Vocational crafts in the pre-vocational Polytechnischer Lehrgang represent a continuation of the previous education.

The overall curricular orientation is preparation for life and for a profession, facilitating transfer from school to work, and providing relevant basic information and skills.

A new dimension to this programme has been added in the form of a pilot scheme, where a Schnupperlehre (a one-week simulation of apprenticeship in industry) has been introduced in order to give the pupil a general notion of work in industry.

Materials, methods and facilities

All teaching media require the approval of the Ministry of Education and Arts, where commissions assess schoolbooks, films, etc. Some books are declared to be 'essential material' and are included in a list from which teachers of a particular class will choose the books they require. These books are supplied to pupils free. The choice of current information (tapes, radio and television programmes) is left to the discretion of the teacher, and any expenses involved have to be met by the pupils.

School equipment in the compulsory programmes (Volkschule, Hauptschule, Sonderschule, Polytechnischer Lehrgang) is not budgeted through the Ministry of Education and Arts. Direct central control of facilities in these schools can therefore not be exerted, although recommendations as to standards do, of course, exist. The AHS building programme, however, is the concern of the central authorities.

Facilities are indirectly determined by the individual curricula, which not only outline what is to be taught in a particular subject, but also indicate the number of lessons per week. Consequently, the equipment and the number of workshops and laboratories in a particular school can be determined according to the programme(s) taught there as well as by the number of pupils. Finally, coverage of the curriculum and consequently the nature and extent of the facilities are monitored by the Inspectorate, who are responsible for maintaining the educational standards of their institutions.

Differences in the content of curricula in Austria only exist where provision has been made in the particular syllabus, as in the case of the Polytechnischer Lehrgang in this age bracket.

Differences respecting local manpower and educational requirements are thus found only in the area of compulsory full-time education and do not necessarily coincide with the distribution of rural and urban areas, although differing interpretations will naturally be in accordance with provincial situations.

Curricula in Austria are designed to provide the frame for the scope and depth of subject teaching, whereas focusing of attention with regard to individual objectives in the actual teaching process is left to the teacher, thus enabling him to adapt his teaching to local conditions to a certain extent.

Teachers

The institution a student of pedagogy will attend depends on the programmes he will have to cover at school, since employment of teachers at a particular type of school is subject to their having acquired the respective teaching qualification.

Teachers for Hauptschule, the special schools for the handicapped, and the Polytechnischer Lehrgang are trained at the Pädagogische

TABLE 3. Curriculum outline School type: Realgymnasium. Level/grade: secondary junior (academic)

Subject group	Subjects	Periods weekly												Total	%
		1st year			2nd year			3rd year			4th year				
		Class.	Lab.	Wsh.	Class.	Lab.	Wsh.	Class.	Lab.	Wsh.	Class.	Lab.	Wsh.		
General	Religious instruction	2			2			2			2			8	
	German	5			4			4			4			17	
	Foreign language	5			4			3			3			15	
	History social studies				3			2			2			7	
	Geography, commercial studies	2			2			2			2			8	
	Musical education	2			2			2			1			7	
	Artistic crafts	2			2			2			2			8	
	P. E.	4			4			4			3			15	65.9
Basic science	Mathematics	5			4			4			4			17	
	Descriptive geometry							2			2			4	
	Biology and ecology	3			2			2			2			9	
	Chemistry										1	1		2	
	Physics				1	1		1	1		1	1		6	29.5
General technical	Vocational crafts (boys)						2			2			2	6	
	Vocational crafts (girls)						2			2			2	6	4.6
Options, general technical	Shorthand										(2)			(2)	
	Typing									(2)			(2)	(4)	
	Practical chemistry													(2)	
	Total number of options: 15														
	Remedial teaching in German, foreign language, maths														

Subject group	Subjects	Periods weekly 1st year Class.	 1st year Lab.	 1st year Wsh.	 2nd year Class.	 2nd year Lab.	 2nd year Wsh.	 3rd year Class.	 3rd year Lab.	 3rd year Wsh.	 4th year Class.	 4th year Lab.	 4th year Wsh.	Total	%
	Total classroom periods	30			30			30			29				
	Total lab periods					1			1			2			
	Total workshop periods						2			2			2		
	Total practice				3			3			4				
	Grand total per week	30			33			33			33			129	

Akademie in three-year (six-semester) post-secondary (i.e. post-Matura) programmes.

The traditional part-time in-service programmes of Volksschule (primary and elementary) teachers leading to Hauptschule teaching qualifications also still exist, and courses of up to six years are available. Qualifications are obtained in two Hauptschule subjects or for two types of Special schools or for one subject and one vocational area in the Polytechnischer Lehrgang.

Teachers of girls' handicrafts and domestic science, on the other hand, obtain qualification by attending a special medium-level secondary school covering general academic as well as professional subjects.

Teachers at AHS-level qualify after a course of four and a half years (nine semesters) at university in one to three (generally two) subjects and obtain the academic degree of Magister.

In-service training of teachers for the compulsory school age bracket is provided at the Pädagogische Institutes, which, though provincial institutions, are subject to general guidance by the ministry as to the topics of in-service courses. These courses cover organizational, curricular and didactic matters and offer information about, and training for, relevant pilot programmes.

In-service courses generally last about a week or less and take the form of seminars, i.e. lectures are given and discussions take place. They are run on a release basis within the academic year. Due to the abovementioned structure of teacher training, differences in the qualifications of teachers at the lower secondary level—in Hauptschule and AHS programmes—reflect the academic level of the programme rather than the fact that they teach general or vocational subjects.

Guidance

Both educational-psychological and vocational guidance is provided for this age bracket in the form of

Psychological counselling offices, staffed by psychologists and psychiatrists and other specialists dealing with the following areas: advice on choice of programmes; diagnosis of learning and behavioural problems and provision of help if necessary; assistance to school authorities and teachers by 'system advice', e.g. on assessment, counselling strategies and procedures, evaluation techniques and research; teacher training; co-operation with other counselling agencies.

Counselling teachers who have received special in-service training and are therefore qualified to provide the necessary information. They are capable of advising pupils individually, helping with learning and behavioural problems, and providing information on further study opportunities.

Vocational counselling as required by law and carried out by officers of the labour exchange administration in co-operation with the schools.

Vocational guidance is provided at grade 8, in the Polytechnischer Lehrgang, and for school-leavers who have not reached these grades. Depending on the provincial decision, labour-exchange counsellors will give advice, spending up to two lessons per year in the appropriate subjects of the Polytechnischer Lehrgang.

Furthermore, the school authorities are obliged to supply the names of school-leavers to the labour-exchange administration, which can then provide counselling individually. A free brochure published by the Ministry of Education and Arts (*ABC des berufsbildenden Schulwesens*) provides comprehensive information on vocational careers of all sorts.

Selection

The nature of selection procedures has been discussed on previous pages in detail. Promotion within the secondary junior bracket takes the form of: (a) passing on to the next grade of the same school; (b) transferring from Stream 2 to Stream 1 of the Hauptschule, depending on the pupil's performance; (c) transferring from Hauptschule to AHS; (d) in pilot programmes (comprehensive projects) transferring from Stream 3 to Stream 2 to Stream 1 in each of three subjects, depending on the pupil's performance in these subjects (setting).

At the end of the secondary lower cycles, passes are required in all subjects of a grade 8 Hauptschule Stream 2 programme as a minimum enrolment condition for the medium- and high-level vocational schools, e.g. enrolment of an AHS or Hauptschule-Stream 1 pupil is possible notwithstanding a 'fail' in foreign language.

Another condition of admission to most vocational medium- and high-level programmes is success in an aptitude test aimed at assessing the pupil's capacities for the professional area concerned rather than his academic achievement.

If admission to an Oberstufenrealgymnasium (upper-cycle AHS programme) is aimed at, overall 'good' Hauptschule Stream 1 results are required for enrolment. (Admission via examination is an alternative possibility).

For admission to the DUAL part-time (compulsory) schools of apprenticeship education, only a previous school attendance of nine years is required and results in previous programmes are immaterial.

Reforms

Reforms in the field of integration have been carried out as follows:

In vocational crafts, the Hauptschule subject for boys has been made accessible to girls and vice versa.

The selection of educational materials is now based on the joint expertise of groups of subject teachers and schoolbooks are provided free of charge.

The training of teachers of Hauptschule programmes in six-semester full-time courses at the Pädagogische Akademie was instituted in compliance with the law.

The School Instruction Act (SchUG) was passed in 1974 and amended in 1977. It has influenced the educational scene significantly by ruling on the responsibilities, rights, and duties of the teachers, parents and pupils as well as on assessment, etc.

Reforms are being tried out with regard to the comprehensive school, day-care centres and all-day schools. Whether or not these pilot programmes will be institutionalized and, if so, in which form and to what extent, is a decision that will have to be made at the national political level.

Integration at the second stage of the secondary level.

The second stage of the secondary level is characterized by a great variety of both vocational and general pre-academic programmes, which are further differentiated with respect to the demand on the pupils' time and intellectual abilities.

General education as such is supplied at pre-academic level in the AHS types of programmes for the 15-to-18 age bracket. Programmes are available at the Gymnasium, Realgymnasium, Wirtschaftskundliches Realgymnasium and the Oberstufenrealgymnasium and provide special training in ancient and modern languages, the arts, sports, sciences and domestic science—all in addition to a common core of 'academic' subjects.

Owing to counselling and selection in the first stage of secondary education, the groups of pupils enrolling in the upper cycles of the AHS are fairly homogenous and reflect the pupils' academic aptitudes. Pupils at the Wirtschaftskundliches Realgymnasium are practically all girls, whereas nearly three-quarters of those attending the Mathematisches Realgymnasium are boys and the foreign-language type of AHS is slightly more popular with girls than with boys. However, overall, the proportion of boys and girls in AHS schools is roughly the same.

With the exception of the Oberstufenrealgymnasium, which is designed to provide pre-academic education for pupils leaving non-academic general first-stage secondary schools (Hauptschule, comprehensive programmes), AHS education is continuous in the sense that enrolment is a mere step from grade 8 to grade 9, while enrolment into the Polytechnischer Lehrgang, covering grade 9, or into the first classes of the full-time medium- or high-level vocational schools means making a more definite vocational choice at the age of 14. Educational counselling as provided by the authorities and various institutions is designed to facilitate the 'age-14 decision', and the system allows for a change of mind after completion of educational cycles, e.g. by granting qualifications (Matura) that lead to post-secondary studies, vocational studies (Kolleg, Akademie, Abiturientenkurse), or by providing adult education courses that carry qualifications of the same nature.

With the exception of the AHS programmes, all second-stage secondary education is technical and vocational.

Apprentice education in the day-release or block-release form is based on a contract with the employer. Boys and girls begin this education at the age of 15 and, while working for their firms, attend school two to four years (usually three years), depending on the nature of their specialization. About half of all 15-year-olds (35 per cent of girls) enrol in these programmes.

Apprenticeship schooling (at the Berufsschule) is compulsory. A variety of technical and vocational full-time school programmes are available to the 15-year-olds. (There are nine specializations in the medium-level and five in the high-level area.

Admission to both medium- and high-level vocational programmes comes after grade 8, and in most cases there is also an aptitude test before enrolment.

Although the distribution of general, general academic, and technical subjects varies according to school level, all of these programmes are characterized by a high degree of integration of general and technical-vocational subjects.

Programmes within the above-mentioned structure are available in more detailed specializations—for example, the technical schools of engineering are subdivided into electrical engineering, mechanical engineering, etc., the agricultural and forestry schools are subdivided into alpine programmes, wine- and fruit-growing programmes, vegetable and flower farming, etc.

Curricula

The extent to which technical and vocational subjects and activities are a required component in curricula for the 15-to-19 age bracket can be defined within the individual programmes rather than in a general way for all students.

While technical and vocational studies are options (e.g. in the Realgymnasium), they form a substantial part of the vocational schools proper (e.g. in the Handelsschule and in the Höhere Lehranstalt für Elektrotechnik).

Curriculum development

Curriculum development is the responsibility of the Ministry of Education and Arts, which publishes national syllabuses, while pilot programmes in the field of non-vocational education are devised, controlled, and assessed by commissions directly under the Minister of Education and Arts.

In the field of vocational education, certain pilot projects involve new educational forms, such as the Aufbaulehrgang, which is designed to provide continuing education comparable to that of a high-level technical school after previous participation in a related medium-level programme, or the Kolleg, which offers technical subjects in a particular area and at a high level for Maturanten and which qualifies its leavers as higher technicians. Other programmes are adaptations of existing technical courses to changing industrial requirements or cover new technical fields. Both types of vocational pilot programmes require approval by the minister, while the provincial educational authorities are involved in their initiation.

Industry has been showing considerable interest in the content of technical programmes and has exerted influence either in direct contact with the ministry or via the employers' and employees' organizations.

Mention should be made here of the fact that a high proportion of the administrative staff in this field of education (inspectors and ministerial

TABLE 4. Curriculum outline. School type: Handelsschule. Level/grade: secondary senior (medium level). Section: commercial studies (specialty)

Subject group	Subjects	Periods weekly										
		1st year			2nd year			3rd year				
		Class.	Lab.	Wsh.	Class.	Lab.	Wsh.	Class.	Lab.	Wsh.	Total	%
General	Religious instruction	2			2			2			6	
	German	3			3			3			9	
	English, incl. techn. English	3			3			3			9	
	Contemporary history				2						2	
	Geography, economic geography	3			3						6	
	P. E.	2			2			2			6	40
Basic science	Commercial arithmetic	3									3	
	Biology and type of merchandise	3				3					6	9.5
General technical	Constitutional, legal studies							3			3	
	Electronic data processing								3		3	
	Micro-economics	3			5			5			13	
	Macro-economics							2			2	22.1
Special technical	Accounting, taxation	4			4	1		4	1		14	
	Shorthand, typing, word processing			5			4			4	13	28.4
Vocational options	Biology, materials					(2)					(2)	
	Micro-economics seminar				(2)			(2)			(4)	
	Special., micro-economics				(2)			(2)			(4)	
	Shorthand, typing, word processing						(2)			(2)	(4)	
	English shorthand, typing, word processing									(2)	(2)	
	New developments, processes	(2)			(2)			(2)			(6)	
	Total number of options: 10											
	Remedial teaching: 6 options											
	Total classroom periods	26			24			24				
	Total lab periods					4			4			
	Total workshop periods			5			4			4		
	Total practice	5			8			8				
	Grand total per week	31			32			32			95	

TABLE 5. Curriculum outline. School type: Realgymnasium. Level/grade: secondary senior (academic). Section: general academic

Subject group	Subjects	Periods weekly													
		1st year			2nd year			3rd year			4th year				
		Class.	Lab.	Wsh.	Class.	Lab.	Wsh.	Class.	Lab.	Wsh.	Class.	Lab.	Wsh.	Total	%
General	Religious instruction	2			2			2			2			8	
	German	3			3			3			3			12	
	1st foreign language	3			3			3			3			12	
	Latin	5			3			3			3			14	
	History and social studies	2			2			2			2				
	Geography and commercial studies	2			3			2			+2			17	
	Intro. to philosophy							3			2			5	
	Musical education	2			2			+			+				
								2			2			12	
	Artistic crafts	2			2			+			+				
	P. E.	3			3			3			2			11	66.9
Basic science	Mathematics	5			4			4			4			17	
	Biology and ecology	2			3			2			2			9	
	Chemistry				1	1		1	1		1	1			
													+2	19	
	Physics	2	1		1	1		1	2		1	2			33.1
Options general technical	Electronic D. P.			(2)			(2)			(2)			(2)	(8)	
	Vocational crafts			(2)			(2)			(2)			(2)	(8)	
	Shorthand	(2)			(2)			(2)						(4)	
	Typing			(2)			(2)			(2)				(4)	
	Domestic sciences			(4)			(4)			(4)				(8)	
	Biology		(2)			(2)			(2)			(2)		(8)	
	Practical chemistry								(2)			(2)		(4)	
	Practical physics					(2)			(2)			(2)		(6)	

TABLE 5 (*continued*)

Subject group	Subjects	Periods weekly													
		1st year			2nd year			3rd year			4th year				
		Class.	Lab.	Wsh.	Class.	Lab.	Wsh.	Class.	Lab.	Wsh.	Class.	Lab.	Wsh.	Total	%
	Total number of options: 29														
	Remedial teaching in German, foreign language, Latin and mathematics														
	Total class. periods	33			32			31			29				
	Total lab. periods		1			2			3			5			
	Total practice							3			5				
	Grand total per week	34			34			34			34			136	

executives) are themselves university-trained engineers, and are therefore able to make a valid examination of any such proposals within the framework of the national educational system. Thus 1979 saw the publication of the syllabuses for a series of Werkmeisterschulen für Berufstätige programmes, the basis of which had been supplied by the Institute of Economic Promotion (an employer-affiliated organization) and the Institute for Vocational Promotion (an employee-affiliated organization).

Technical and vocational subjects

The objectives, organization and content of technical and vocational programmes, as well as all other official educational programmes, are based on the Schools Organization Act (SchOG) and are described in detail in the curriculum of each programme.

The individual curricula are organized according to a standard pattern and consist of sections dealing with the general purpose, objectives and didactic principles, as well as a table of subjects listing the numbers of lessons per grade and week.

Additionally, the individual subjects are defined with respect to their objectives, themes and specific didactic principles. Hence, the nature, extent, depth and content of the matter treated in the individual subjects, whether general, scientific, or technical in nature, reflects the general purpose of a particular programme and the ratio between practical and theoretical work is laid down accordingly.

In the Berufsschule (apprentices' school education) the number of periods within the individual programmes is defined in the curriculum, and for apprentices the proportion of practical work to theory is roughly 10 : 3. The actual number of lessons in the individual subjects within these provisions is decided upon by the provincial authorities. The general objectives of this compulsory programme for apprentices are the provision of elementary technical and theoretical knowledge, the promotion and supplementing of the apprentices' industrial training and the extension of his general education.

All but one of the compulsory subjects taught at the Berufsschule are vocational, and general subjects are usually offered as options.Technical work covers the relevant materials, tools, machines and processes and related knowledge as well as fundamental theory including basic technical drawing, economics, law, and industrial safety precautions.

Practical work comprises workshop practice, and applied theory is taught so as to promote the integration of the apprentice's work in industry with the information he receives at school.

The high-level schools of engineering and related studies (Höhere technische und gewerbliche Lehranstalten) serve a triple purpose: they provide high-level education in the particular specialisation, they give training in industrial and commercial crafts, and they prepare for university education.

Subject groups comprise general subjects and sciences at preacademic level, elementary and advanced technology, design and practical work, the latter including construction work.

Although general subjects such as foreign language (nearly always English), German, geography and commercial studies have been listed in a typical curriculum outline as subjects conferring general knowledge, they also carry a substantial technical content in so far as the matter treated is geared to the respective technical line where possible, a principle that also applies to scientific subjects.

The pattern of subjects as shown in the curriculum outline presented here is typical of this type of programme in so far as the percentages indicated apply to practically all of the nearly thirty standard varieties of programmes available, and specialization beyond the classical fields does not begin before grade 11 to any significant extent.

The proportion of practical work within the syllabuses of the high-level vocational schools is more than 20 per cent of the compulsory subjects, while the medium-level schools are characterized by a higher proportion of practical lessons (just under 30 per cent), less theory and less general education.

Professional qualifications are obtained through both high- and medium-level programmes, both of which are in fact designed to qualify their pupils as skilled craftsmen. University admission, however, depends on obtaining a Matura qualification, which can only be obtained via the high-level programmes.

The objectives, organization and content of the practical subjects in the high-level and, to an even greater extent, in the medium-level technical and vocational programmes reflect standards set in the related apprentices' education and fit into the general policy of the individual programmes.

Professional skills as taught in the schools' own workshops are the basis for professional qualification as skilled workers, which the pupil gains at the end of his career at school or for which he receives credit if he leaves school before completing the course. Given the broad basis of practical workshop training as well as the specialization undertaken, a number of professional qualifications (e.g. skilled electrician, mechanic) are usually acquired, which facilitates the pupil's later career in case he wishes to enter another professional field.

Other medium-level programmes are designed to provide continuing vocational education for skilled workers (some leading to the Meisterprüfung) or to train students for teaching, nursing, or tutoring.

Work-study programmes

The most popular type of work-study programme is the above-mentioned apprentice education. Further qualifications in this field available to graduates from both the DUAL apprentice education and the high- and medium-level vocational schools require a combination of time spent in the particular trade, examinations which have to be taken with the respective guild, and attendance in specified technical school programmes.

In another type of work-study programme, industrial practice is a curricular requirement and is carried out by the pupils during vacations. Thus pupils of the high-level vocational schools of engineering have to spend eight weeks in industry during their school career, and it is explicitly demanded of the teachers that the pupils' working experience should be made use of in subject teaching. This also applies in principle to the medium-level Fachschulen. Another type of work-study programme, again in the field of medium-level vocational education caters for the seasonal professions and allows trainees to work in their profession (e.g. bricklaying) when manpower demand is at its peak. This programme provides for one term at school each year in courses spanning several years.

A work-study programme that is receiving increased attention offers technical adult education in evening classes, where professional skills in

Table 6. Curriculum outline. School type: Hohere technische Lehranstalt. Level/grade: secondary senior (high level). Section: engineering (specialty, electrical engineering)

Subject group	Subject	Periods weekly																
		1st year			2nd year			3rd year			4th year			5th year				
		Class.	Lab.	Wsh.	Class.	Lab.	Wash.	Class.	Lab.	Wsh.	Class.	Lab.	Wsh.	Class.	Lab.	Wsh.	Total	%
General	Religious instr.	2			2			2			2			2			10	
	German	3			2			2			2			2			11	
	Foreign lang.	2			2			2			2			2			10	
	History, social studies				1			1			2						4	
	Geography, commercial st. 2				1			1									4	
	Constitutional, legal studies													1			1	
	Environmental, safety studies													1			1	
	P. E.	2			2			2			1			1			8	23.9
Basic science	Maths, applied maths	4			4			4			4						16	
	Des. geometry	2			2												4	
	Physics, applied physics	1	1		1	1		1	1					2			8	
	Chemistry, applied chem.	1	1		1	1											4	
	Mechanics				2			2			2						6	18.5

TABLE 6 (*continued*)

Subject group	Subject	Periods weekly																
		1st year			2nd year			3rd year			4th year			5th year				
		Class.	Lab.	Wsh.	Class.	Lab.	Wash.	Class.	Lab.	Wsh.	Class.	Lab.	Wsh.	Class.	Lab.	Wsh.	Total	%
General technical	Machine parts, design practice	3			3												6	
	Basic mechanical engineering							2			2						4	
	Mechanical technology	2			3												5	
	Fundamentals of electrical engineering	1	1		2	1		4									9	
	Control systems mech., elect.										2			3			5	
	Electronic data processing											2					2	
	Econ., related legal studies													3			3	16.6
Special technical	Electrical measuring				2			2									4	
	Elec. machines, design pract.							3			6			6			15	
	Elec. plants, design pract.							2			4			6			12	
	Electronics, elec. comm.			13			8			7							28	
	Advanced elec. workshop												3			3	6	
	Electrotech. lab.								3			4			5		12	41.0

Subject group	Subject	Periods weekly																
		1st year			2nd year			3rd year			4th year			5th year				
		Class.	Lab.	Wsh.	Class.	Lab.	Wash.	Class.	Lab.	Wsh.	Class.	Lab.	Wsh.	Class.	Lab.	Wsh.	Total	%
	Compulsory industrial practice: eight weeks in five years																	
Technical options	Shorthand and typing	(2)					(2)										(4)	
	New developments								(2)			(2)			(2)		(6)	
	Remedial teaching in German, foreign language, applied maths																	
	Total classroom periods	25			30			30			32			31				
	Total lab periods		3			3			4			6			7			
	Total workshop periods			13			8			7			3			3		
	Total practice	16			11			11			9			10				
	Grand total per week	41			41			41			41			41			205	

the form of apprentice's qualifications are credited and reduce the five-year 24-periods-a-week courses by one year.

In another 'adult' (medium-level two-year) programme, the completion of a cycle leading to the skilled worker qualification is a condition of enrolment.

Materials and methods

Educational materials used for the second stage of technical and vocational programmes consist of such standard items as books, films and the like as well as workshop and laboratory equipment.

What has been said about the selection of teaching media in general and about books in particular also applies to the field of vocational education, and both textbooks and specialized technical books are supplied to the pupils and in fact become the pupils' property.

Although production is not the foremost objective of workshop activity, attention is focused on completing products so as to encourage the pupil's motivation and participation in the course (e.g. in the clock-making programme, where the pupil will take a clock home which he has made by himself at the end of his second year at school).

Products may also be the result of co-operation between individual schools (e.g. the production of a lathe) and will then be used as equipment in schools.

'Open-day' guided information tours for parents and potential pupils in vocational schools as well as information provided by the Ministry of Education and Arts have also helped to draw attention to educational facilities and in particular to the vocational programmes.

A field of educational innovation, designed to update educational materials and to set out and classify the teaching objectives of individual subjects is the Lehrzielbank project (a bank of performance objectives). Teams of from three to seven selected teachers work out teaching objectives at home and discuss them in weekly meetings. These carefully selected objectives are then published and given to the respective subject teachers. Some projects involve individual subjects and others cover more than one. One of the advantages of the project approach is to help teachers and students to evaluate performance while, in addition, the learner's motivation is increased, since he sees the practical outcome of his efforts.

Physical facilities

Beginning with the schools of engineering, teams of teachers and administrators under the guidance of the Ministry of Education and Arts have devised standard equipment programmes for the schools concerned on the basis of curricular provisions. As a consequence, it is hoped that investment in school equipment can be carried out more efficiently.

Workshops and laboratories exist on the school premises, and workshop practice and related activities are classified as subjects and are taught by specially trained teachers. For basic workshop courses, each learner has an individual work place; whereas for advanced courses, group training is given on a rotating principle. This system allows for maximum utilization of expensive workshop and laboratory facilities, since it ensures that uninterrupted use is made all year long.

To ensure the necessary supervision of the pupils when technical subjects are taught in workshops and laboratories, the pupil-teacher ratio is reduced to 1 : 12, 1 : 6, or even less, depending on the risk involved.

'Workshop' practice may also be carried out on building sites or similar places where installations and repairs are performed, provided that the work coincides with the provisions of the individual curriculum.

Where possible, workshop products are finished by the individual pupil. However, when complex procedures are involved, several departments of a particular school or even several schools may co-operate in constructing the product. These 'saleable items' are either purchased by the pupil himself, who must pay for the materials, or are exchanged for products from other schools via a central warehouse.

Differences between rural and urban areas

Differences between rural and urban areas as to the content and implementation of curricula in general and technical and vocational programmes of second-stage secondary-level schools are the exception. They occur only where curricula actually provide for deviations in the allocation of teaching hours within the national curricula, e.g. in the field of apprentices' education, where responsibilities—and financing—rest with the individual provincial authorities and local manpower requirements have to be taken into account, or where the provincial authorities have the right to add a few teaching hours to supplement a national syllabus (e.g. two extra lessons in the programmes of the high-level schools of engineering).

It should, however, be borne in mind that there is a great variety of specialized syllabuses in technical education, owing to the variety of existing educational programmes designed to meet local and national manpower requirements. The content of technical curricula may differ regionally: some 'national' i.e. centrally approved curricula (many of which are variations of standard programmes) have originally evolved locally in a particular industrial atmosphere and are now distributed unevenly. Some programmes are even unique and yet are run according to a nationally approved syllabus.

The fact that technical syllabuses at federal level are rather general helps to adapt individual 'standard' curricula to local and provincial industrial requirements. Stress can thus be laid on one or the other curricular aspect provided the approval of the relevant inspector can be obtained. The inspectors' responsibilities also cover the field of curricular implementation, and meetings of inspectors and their ministerial opposite numbers are held at regular intervals, which helps to ensure a high level of uniformity with respect to implementation. The system of leaving examinations, where chairmen of the boards of examiners are proposed by the provinces and appointed by the ministry, is another factor having a positive influence on the standard of implementation.

This also applies to budgeting, since the school-building programme, as well as the purchase of equipment, is subject to approval by the

Ministry of Education and Arts, which finances according to existing guidelines.

Teachers

The conditions of teaching qualifications for individual programmes are laid down by law and require university training for AHS teachers and teachers of academic subjects and technical theory at high- and medium-level technical and vocational schools. While grammar-school (AHS) teachers have traditionally had to obtain their teaching qualification in two subjects in the form of Lehramtsprüfungen after at least eight semesters at university, teachers of technical theory graduate from technical university college and spend at least two years in industry—four years if there is no Lehramtsprüfung available. (The Lehramtsprüfung is a set of written and oral examinations before an academic forum, which assesses the academic level as well as the pedagogical knowledge of the applicant). Technical Lehramtsprüfungen are required for commercial subjects and for agricultural programmes and are not obtainable in the field of engineering. A system of teaching courses for academics preceding or beginning with the actual teaching career is designed to supply them with elementary pedagogical and essential teaching skills as well as to ensure the necessary knowledge of legal provisions for all teachers, especially those coming from industry.

Another group of qualified teaching personnel consists of workshop teachers. Given the professional qualifications the pupil receives at the end of his school career, great attention has been laid on the training of workshop teachers, and the conditions of their employment comprise professional qualification (Lehrbrief plus Meisterbrief, etc.) in combination with a specified period of employment in industry (i.e. a minimum of five years for the schools of engineering) before they are admitted to full-time one-year teacher-training programmes at the Berufspädagogische Akademie (BPA). Their training comprises general and applied science of teaching and a selection of general programmes including behavioural studies. While attending this course the applicant is paid as a teacher.

In-service training programmes are carried out by the Pädagogische Institute (PI) in the field of AHS programmes and by the Berufspädagogische Institute (BPI) for the area of technical vocational education. Like the BPAs, the BPIs are situated in the individual provinces, headed by directors and staffed by a number of part-time and full-time experts.

Vocational in-service programmes for teachers (the vast majority of which are conducted during the academic year on a work-release and full-pay basis) are first determined by the inspectors individually and then co-ordinated during an annual meeting of inspectors and administrators, where 'central' pilot seminars and regional seminars are fixed and experts (usually teachers or administrators) are proposed to take charge of the seminars. The actual appointment of the expert in charge (Seminarleiter) and the organization of the seminar are then carried out by the BPI concerned.

The individual seminars are conducted according to plans submitted by the Seminarleiters, either in 'workshop' form or in that of lectures, or a mixture of both, depending on the themes treated. They are organized as three 'boarding' type seminars of three to seven days at one of the seminar centres, or in the form of, say, a couple of hours a week at a school computer terminal.

For the initial teacher-training courses, participation in in-service training programmes is voluntary and does not have any effect on salaries. Participation may be of significance with respect to the three-stage assessment of the teacher's performance, however, and promotion is often helped by a good record in this respect.

Because of the scope of the qualifications required of the individual teacher and in view of the fact that the public is responsive to trends in education, the retraining of teachers has not yet proved necessary, although in-service seminars could certainly be arranged if required.

As a rule, teaching careers in the vocational medium- and high-level school system favour the university graduate, since promotion to head of department, headmaster, inspector and other administrative posts is reserved for academic graduates.

Teaching hours are slightly higher for the teachers of practical skills, although the fact that they often teach smaller groups of pupils may partly make up for this.

At school level, non-university trained teachers represent a fully integrated and recognized work-force, and their judgement carries the same weight as that of any other teacher, if not more.

Some technical schools have testing institutes where industrial products are tested and receive release qualification before going on sale and where such materials as cable-car cabins and ropes are regularly checked. These institutes are staffed with teachers of their affiliated schools and ensure an effective link with industry.

Owing to the nature of their training, vocational teachers often freelance for industry in their spare time, which undoubtedly enriches the quality of their teaching considerably.

In addition to teachers, heads of departments (who are responsible for the running of such specialized technical programmes as mechanical engineering or biochemistry), headmasters and office staff, there is a category of personnel in the technical schools whose position is intermediate between teaching, administration, and technical assistance: the typical 'Assistent' (his official title) has graduated from a high-level school and has started studying at university. His job at school comprises assisting teachers in laboratories (including the preparation of experiments and their demonstration) as well as working out timetables. Their contracts usually cover a period of four years involving 20 working hours a week, and they are assigned to the individual heads-of-department.

Guidance

Given the high degree of specialization in the technical upper-secondary age bracket, vocational guidance does not bear the same level of importance as in the lower bracket.

In the field of educational guidance, the system of counselling teachers was introduced in the 1970s in an effort to tackle the special problems of the age-group under discussion. Depending on the size of a school, one or two specially trained teachers are appointed to this function.

Educational and vocational guidance as well as personal advice are offered in the traditional way by the Klassenvorstand (form-master).

Selection

Selection procedures mark the end of both medium- and high-level programmes at the second stage.

While some of the medium-level school-leavers undergo Abschlussprüfungen or Befähigungsprüfungen, consisting of written work (sometimes project work) and oral examinations before a board of examiners, all students of the high-level pre-academic and technical schools graduate by completing the Reifeprüfung (Matura).

The Reifeprüfung consists of a series of examination papers (e.g. German, technical project), taking up to a week, and a number of compulsory and elective oral examinations before a board of examiners (subject teachers). It is usually chaired by the provincial inspector or a specialist in the field, both of whom are appointed by the minister. Graduation carries the right of admission to university studies or to a Kolleg or, alternatively, ensures employment in senior positions in industry. The Matura qualification also ensures better pay in public administration.

In the high-level schools of engineering and agriculture, the professional title of Ingenieur is awarded to graduates after three years' work in an appropriate position in industry.

Transition between school and work

Measures designed to facilitate the transition from school to active employment include the introduction of the grade-9 Polytechnischer

Lehrgang, a year of pre-vocational training and the institutionalization of the career guidance teacher. Occupational guidance as such is offered to school leavers in the form of instruction at school level (in the lower cycles of secondary education) and through individual counselling.

Since work experience is demanded by practically all medium- and high-level vocational programmes, transition between school and work is facilitated in so much as the working world has become part of the pupil's experience by the time he leaves school and working contracts often result from these early contacts.

Relations between school and work are encouraged by:

Personal contacts between the teachers and industry (technical and vocational teachers start their careers at school after at least four years of employment in industry and tend to maintain their links with industry).

In-service teacher-training courses, where experts from industry are invited to lecture on trends and developments in industry.

'Old boys/girls' organizations of the high- and medium-level schools, consisting of graduates from a particular school, which are in a position to advise school-leavers on the choice of a profession.

The institution of 'public' leaving examinations, which (in the field of technical education) representatives from trade and industry are invited to attend.

Credit systems are operative in technical education in so far as trained craftsmen who have passed through a DUAL programme receive credit with respect to workshop practice in the second stage of secondary education (including its adult equivalents). On the other hand, credit towards the DUAL training is granted to those who discontinue attendance in a technical programme if the two professional lines are compatible. These credit systems are not in an experimental stage: they comprise well-defined rights, indicating how many years of attendance of which particular specialization one would receive credit for what profession and to what extent.

Transition between work and education is further facilitated by a system of adult education that incorporates working experience and/or provides the respective practical training.

Conclusion

The success of technical and vocational second-stage secondary education in Austria can best be illustrated by the increasing popularity of these programmes. This is undoubtedly due to the nature of the programmes available, which allow for the acquisition of professional skills and for general education.

Other reasons are perhaps the broad scope of courses in this field and the availability of technical specialization, plus the fact that qualifications granted at the individual level are well defined. In this connection it should also be stated that programmes are mostly available at different levels, ranging from training courses covering skilled craftsmanship to high-level technicianship—a fact which certainly helps the trainee to choose his/her programme. General education is part of the individual programmes to a varying degree: its extent and academic level are defined by the curriculum of the particular programme. High-level technical schools, for instance, are characterized by a comparatively high range of pre-academic general subjects, which contributes to the fact that their graduates enjoy the same rights as AHS (grammar school) leavers with respect to admission to university studies.

While general subjects in high-level technical programmes naturally embody objectives that hardly differ from those in the AHS programmes (this applies, for example, to literature and history), they are also oriented towards the particular technical line in so far as they provide the pupil with the skills he or she will require in industry. Thus, English as a subject in technical programmes is geared to the area of specialization, and one of the objectives is to enable the pupil to read the technical literature in that language. At a lower academic level this principle also applies to medium-level technical programmes.

In line with the steadily rising standard of qualifications in trade and industry and with the growing awareness of professional and general skills, more and more employees take advantage of adult education. Where the state runs these schools, training is free, as are schoolbooks. Adult courses are generally offered in the form of evening classes and 'releases' are the exception, owing to the fact that employers are still somewhat reluctant to consider a raise in their employees' qualifications as an asset to the firm. Some firms have indeed taken the training of their employees into their own hands. This is particularly the case in those areas where, owing to a high degree of specialization and the high rate of technical innovation, programmes at school level cannot be provided, especially where the industrial application of innovation cannot yet be assessed.

On the other hand, highly specialized technical programmes for employees are often run by or in technical schools, utilizing the advanced know-how of specialist teachers as well as the available equipment.

In an economy where small and medium-sized (yet often highly advanced) industrial firms exist side by side with a few larger firms (medium-sized by international standards), the particular structure of technical education can have a decisive supporting function with regard to manpower requirements and technical know-how—a function Austria's educational system undoubtedly fulfils satisfactorily at present.

Brazil

Carlos Alberto Tavares[1]

Profile of second-level education

Structure of the system

Figure 1 provides an overall picture of the structure of the Brazilian education system.

Technical and vocational education is an integral part of the curricula of both primary (lower secondary) and secondary (upper secondary) schools. All the curricula, either at the lower or at the upper secondary level, include vocational subjects.

As a general rule, articulation between school and work comes at the end of the 11th or 12th grade, which is the point at which those students who decide not to continue their studies in higher education enter the world of work. In the programmes that aim at the preparation of middle-level technicians, principally in the secondary sector, the 12th grade represents the year in which students participate in an approved work training programme as required for the diploma of middle-level technician.

A significant problem leading to an earlier transition between school and work is the drop-out phenomenon. Since there are no data on follow-up of early school-leavers, it is rather difficult to estimate the proportion of those who enter the world of work.

There is no selection examination preceding passage from primary (lower secondary level) to secondary school, except in cases where the demand is higher than school capacity.

Although the major purpose of the Educational Reform Law (Law 5692/71) was to establish a comprehensive school system with technical vocational offerings for all students, there are approximately a hundred specialized technical industrial schools that prepare industrial tech-

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[1] The following specialists collaborated with the author: Ambrosina Costa Coradi, Clelia Capanema, Cleuza Cotta de Oliveira, Godeardo Baquero Miguel, Lucia Maria da Cruz Suzart and Vicente de Paula Fonseca. The study does not necessarily represent the official opinion or policy of the Ministry of Education and Culture.

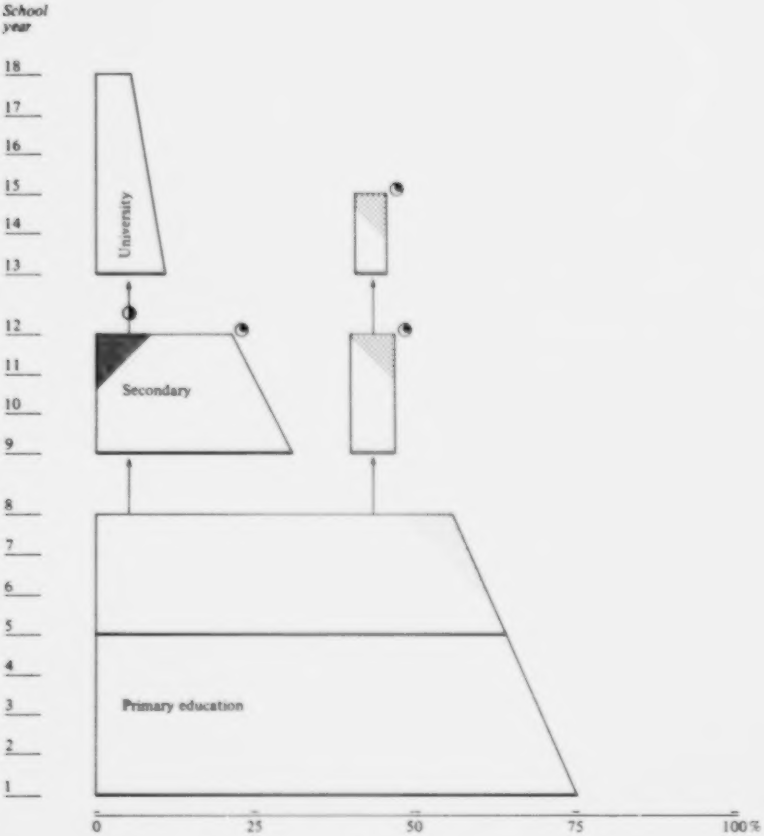

School year
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
University
Secondary
Primary education
0
25
50
75
100%

FIG. 1. Diagram of the Brazilian education system.

nicians. Of these, twenty-three are federal supported. The other industrial technical schools are administered by several types of institutions: fifteen are under the National Service for Industrial Apprenticeship (SENAI), which is an organization supported by industry and linked to the Ministry of Labor, thirty-six are private, seventeen are under state control and eight are directly subordinate to industries.

There are also thirty-two specialized technical agricultural schools, which are controlled by a National Office for Agricultural Education (COAGRI), an institution linked to the National Office for Primary and Secondary Education of the Ministry of Education and Culture (MEC). There is just one specialized technical commercial school supported by the federal government.

Table 1. Percentage of age-groups enrolled at lower and upper secondary levels in 1979

Age-Group	Total population	School percentage
11–14	11 894 324	77
15–19	13 163 700	21

Source: MEC/SEPS

Table 2. Enrolment by type of programme at upper secondary level

Programme	Number of students	
General	552 875	20
Technical-vocational	2 211 502	80

Source: MEC/SEPS. Estimates based on a sample of states.

Secondary-level enrolment

The percentage of the age groups enrolled at the lower and upper secondary levels is shown in Table 1. Table 2 shows the enrolment by type of programme at upper secondary level (grades 9–12)

Many schools still offer general programmes only and cannot yet meet the requirements of the Educational Reform Law (1971) for compulsory technical and vocational education. One of the major reasons for not adopting technical vocational programmes is the preference of students and parents for general education leading to college entrance. The other significant reason is that approximately half of the schools are private and are not willing to invest in costly technical vocational programmes.

Approximately 10 per cent of those students who complete secondary education (grade 11 and/or 12) continue their studies at college level. However, the demand for college education is significantly higher as compared with the number of students who actually pass the college entrance examination.

At primary-school level the number of girls is slightly higher than the number of boys, as is also the case at upper secondary level, varying from 51 to 55 per cent among the different regions of the country. The ratio of students to teachers is 23 to 1 at the lower secondary level and 11 to 1 at the upper secondary level. The reason for these relatively low ratios is that a great number of teachers teach in two or more schools and are counted more than once. There are relatively few full-time teachers at the upper secondary level.

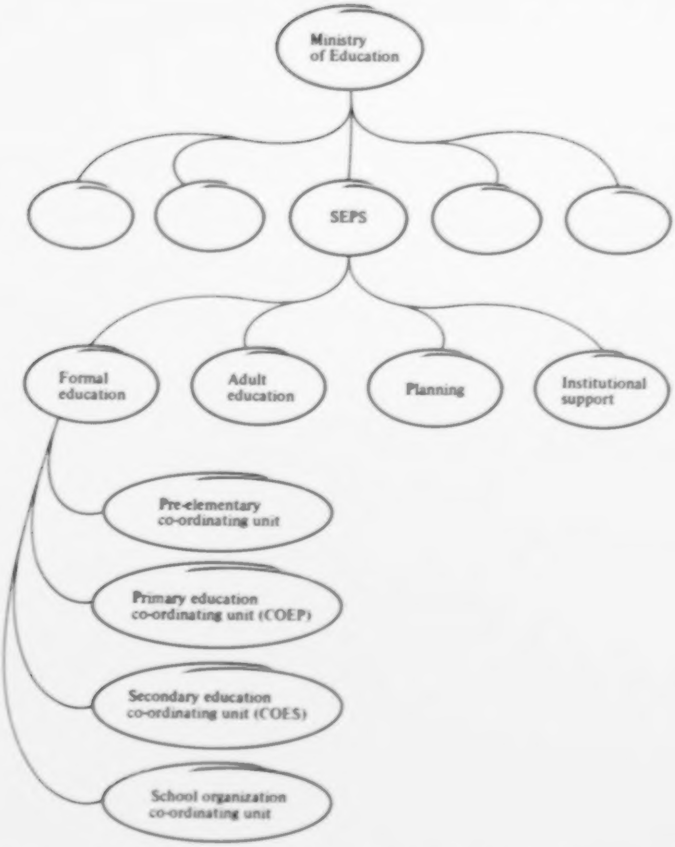

Ministry of Education
SEPS
Formal education
Adult education
Planning
Institutional support
Pre-elementary co-ordinating unit
Primary education co-ordinating unit (COEP)
Secondary education co-ordinating unit (COES)
School organization co-ordinating unit

FIG. 2. Administrative structure of the National Office for Primary and Secondary Education (SEPS).

Administration

The administrative structure of primary and secondary education at the national level is the responsibility of the National Office for Primary and Secondary Education (SEPS). Figure 3 indicates the absence of a separate structural unit for technical and vocational education.

Technical and vocational education at the lower secondary level (grades 5 to 8) is the responsibility of the Primary Education Co-ordinating Unit (COEP). There is no separation between general and vocational education within this co-ordinating unit.

At the secondary level (grades 9 to 12), the situation is analogous, i.e. there is no clear identification of technical vocational education within the Co-ordinating Unit for Secondary Education (COES). There are no staff members with specific duties in the area of technical and vocational education. However, there are several institutions with responsibility for technical and vocational education which are linked and more or less subordinate to the National Office for Primary and Secondary Education (SEPS). These institutions are:

Colégio Clovis Salgado (Technical Commercial School).
Colégio Pedro II (a secondary school which offers general education programmes and is initiating vocational programmes).
Brazilian Centre for School Construction and Equipments (CEBRACE).
National Co-ordinating Office for Agricultural Education (COAGRI).
National Centre for Vocational Human Resources Development (CENAFOR).
Technical Federal Schools (ETF).
National Literacy Programme (MOBRAL).
National Centre for Human Resources (CRHJP).
National Centre for the Disadvantaged (CENESP).

To sum up, the major administrative responsibility of the two Co-ordinating Units for Primary and Secondary Education is to co-ordinate certain of the above-mentioned institutions that are developing programmes related to technical and vocational education.

Financial situation

Federal expenditures for technical and vocational education allocated by the Ministry of Education and Culture (MEC) through the National Office for Primary and Secondary Education (SEPS) amounted to Cr$ 1,798,847,000 in 1979. These funds relate to the upper secondary level only, since no information is available on expenditures relating to the lower secondary level. Table 3 shows the breakdown of federal expenditures by type of institution.

There are other federal institutions that support federal and state programmes in the area of technical and vocational education, but there is no information available as to the amount of funds allocated to technical and vocational education. For example, the National Fund for Educational Development (FNDE) allocated Cr$ 657,033,000 for secondary education as a whole, but it is difficult to estimate what proportion of this amount went to technical and vocational education.

Federal funds allocated to State Departments of Education in 1979 amounted to Cr$ 226,200,000. These funds were allocated through projects as shown in Table 4.

TABLE 3. Federal expenditures for technical and vocational education by type of institution in 1979

Institution	Expenditures (Cr$)
Technical industrial schools	1 284 867 000
COAGRI (agricultural schools)	386 089 000
CENAFOR (human resources)	74 081 000
CEBRACE (school planning)	26 700 000
Technical commercial school	26 910 000
TOTAL	1 798 647 000

Source: MEC/SEPS, 1979.

TABLE 4. Project funds allocated to states in 1979

Projects	Amount of funds
School-work experience	4 600 000
Vocational clusters	146 000 000
Curricula development	6 800 000
Human resource training	10 775 000
Private schools	27 800 000
New methodologies	4 000 000
Others	26 225 000
TOTAL	226 200 000

Source: MEC/SEPS

As from 1980, policy formulation became highly decentralized. The Ministry of Education and Culture (MEC) established two major programme areas: Education in Rural Areas and in Surrounding Metropolitan Areas. The state Departments of Education will select their projects and submit them to the ministry for approval. The criteria for the allocation of funds to each state were school population and number of schools.

Local funds allocated to technical and vocational education are not significant in comparison to state and federal funds as a whole.

Cost per student varies considerably, depending on the type, level and quality of the technical vocational programme. The national average cost for primary education amounted Cr$ 70.68 and Cr$ 593.75 for secondary education (upper level) in 1977. Cost per student in technical federal schools in 1977 amounted to Cr$ 16,500.

There are cases where costs are not significantly different between general education (programmes that aim at college preparation) and technical vocational programmes.

As to non-formal training systems, figures show that the cost per student is lower than in formal training programmes.

Policy of secondary education: its formulation and trends

Underlying philosophy

Technical and vocational education is an integral part of the curricula of primary and secondary schools. The relationship between the amount of general and vocational education at the primary and secondary levels is shown in Figure 3.

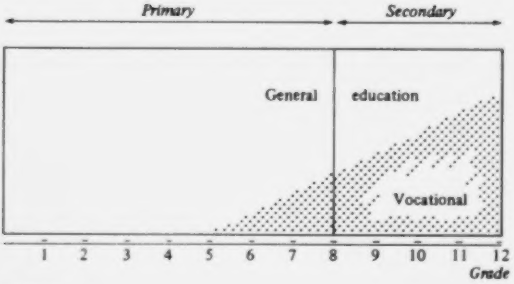


FIG. 3.

At the primary level (lower secondary level), vocational education is exploratory in nature and includes four basic activity areas in which students are given the opportunity to become familiar with the world of work. These four areas are agriculture, the industrial arts, commercial techniques and home economics.

In the technical stream at secondary level, there are two basic types: programmes that aim at the preparation of middle-level technicians in agriculture, industry and service areas; and programmes (below the technician level) that aim at preparing students to enter either the world of work and/or higher education.

The programmes at technician level require a minimum of 1,200 hours of vocational subjects for the primary and secondary sectors and 900 hours for those classified in the tertiary sector. Usually, in those vocational programmes classified as being within the secondary sector, students are required to participate in a supervised work-experience programme in a selected industry so as to be eligible for the diploma of technician. The minimum duration of the work-experience programme (on the job training) is 10 per cent of the total hours devoted to vocational subjects.

TABLE 5. Number of vocational programmes by technical level

Programme type	Number
Technician level	96
Below technician level	
one occupation	85
group of occupations	10
TOTAL	191

TABLE 6. Mechanism for formulating educational legislation

Institution	Function
Federal Council of Education	Approves the subjects for the national general education core curriculum Defines the objectives and amplitude of these subjects Approves the subjects for the national core curriculum for each technical vocational programme Approves other technical vocational programmes proposed by schools
State Councils of Education	Approve subjects in accordance with state needs that can be chosen by the schools Approve subjects suggested by the schools other than those already approved at the national and state levels Approve other technical vocational programmes for the regional level
Schools	Select subjects to meet local and regional needs for each programme Adopt, with the approval of the state Council of Education, other vocational programmes for which there are no minimum curricula requirements

Programmes below technician level require at least 300 hours of vocational subjects when aimed at preparation for one specific occupation and approximately 600 hours when aimed at preparation for a group or family of occupations.

The minimum total duration of all programmes at technician level within the primary and secondary sectors is 2,900 hours, excluding the work-experience programme and workshop activities.

These programme standards are approved by the Federal Council of Education for the whole school system.

The Federal Council of Education approved 191 technical vocational programmes at national level in the period 1972–79. Table 5 shows the number of these programmes by technical level.

There are also several technical vocational programmes approved by state Councils of Education. These state-approved programmes may also be approved by the Federal Council of Education for national validation as to certificate requirements.

The mechanism for formulating educational legislation that has been approved by the Federal Council of Education is shown in Table 6.

Changes and prospects

The major change in policy formulation in the last ten years came about with the Educational Reform Law 5692/71, which made technical and vocational education compulsory at the primary (lower secondary) and secondary education levels. To meet the requirements of the Law, the Federal Council of Education in 1972 approved a total of 130 technical vocational programmes, of which 52 were classified as designed to prepare middle-level technicians and 78 to provide preparation of students for one specific occupation.

As a natural consequence of the difficulty of implementing specific technical vocational programmes, both at the technician level and below this level for one specific occupation, the Federal Council of Education in 1975 approved a total of ten vocational programmes as 'basic' to the preparation of students for a group or family of related occupations. The major emphasis in this type of technical vocational programme was to leave practical or skill training under the responsibility of the employer. Students would receive a basic core curriculum with emphasis on technological knowledge common to a family of occupations. These programmes were approved with the stipulation that at least 600 hours be devoted to vocational subjects, except for one (credit and finances), which requires at least 420 hours of vocational subjects. These programmes were as follows:

Primary sector: agriculture.
Secondary sector: construction, mechanics, electricity, electronics, chemistry.
Tertiary sector: commerce, credit and finances, administration, health.

Future prospects concern the expansion of the basic or cluster vocational programmes in general secondary schools. The technical schools will continue with programmes that aim at the preparation of middle level technicians, and there will be less emphasis on vocational programmes that aim at preparation for one specific occupation.

Other major policy changes involve emphasis on the development of Interschool Vocational Centres, which are to provide technical vocational training for students from several general secondary schools and for students at the lower secondary level who will probably not continue their studies at the upper level.

Major issues

Economic needs

The Educational Reform Law (1971) stipulates that the selection and planning of technical vocational programmes be carried out in the light of labour market needs. Several state Departments of Education and local school systems have tried to estimate labour-market needs through man power surveys so as to ensure efficient development of their programmes. However, the lack of labour market data at regional and national levels as well as of input data essential to manpower projections seriously limit rational technical vocational planning at regional and national levels.

One of the major efforts towards solving this problem is an attempt to establish a follow-up system for technical vocational graduates involving local schools, state Departments of Education and the National Office for Primary and Secondary Education through a data-collection mechanism that facilitates data treatment and analysis. At present, several schools and state Departments of Education are evaluating instruments and methodologies for data collection. Additionally, some contacts have been made between the National Office for Primary and Secondary Education and the Federal Processing Data Service (SERPRO), so that essential employment data processed by SERPRO may be made available for technical vocational educational planning at the national, state and local levels.

Social aspects

Youth unemployment. Youth unemployment is a major concern of the educational administration. The Ministry of Education, Ministry of Labour and Ministry of Interior are now developing vocational education programmes for unemployed youth in both rural and urban areas.

In addition to the high percentage of youth in the country's population pyramid and the relatively high number of youth not attending the regular school system, the proportion of those leaving school early is extremely high, mainly in rural areas. This situation has become a challenge to the educational system as a whole.

In order to alleviate the social consequences of youth unemployment, the Ministry of Education and Culture set up two national priority programmes: Education in Rural Areas and Education in Surrounding Metropolitan Areas. These programmes are designed to furnish unemployed youth and adults with vocational education in line with their future engagement in the world of work as productive citizens. Other factors making for the social improvement of youth and adults will be incorporated in these programmes, such as health care, basic literacy, domestic economy, housing facilities, etc.

Drop-outs. The high rate of school drop-outs at primary level, mainly in the first and second grades, represents a major challenge to the educational system as a whole, involving low attendance in the upper grades. Action taken in order to diminish the effects of this situation is as follows:

Higher salaries for school teachers.
Scholarships to retain students in both public and private schools.
Improved school facilities.
Provision of food to retain children in school and improve their learning capacity.
Adoption of flexible school calendars in rural areas in order that students may help their families during harvesting.
Introduction of more attractive learning activities in school curricula, such as relevant learning experiences.

School-leavers. Several measures have been taken to provide educational opportunities for early school-leavers, including incentives in connection with non-formal educational programmes for youths and adults who have dropped out of school. Several programmes were initiated during the decade 1970–80 with a view to improving the educational level of the population, such as the Brazilian Movement of Literacy programme, non-formal vocational programmes developed by several institutions, including the Ministry of Education and Culture, and other forms of socio-educational assistance.

Certification. The problem of promotion in schools (mainly for early school-leavers), the difficulty of obtaining a technical job, and the improvement of social status have been alleviated through a system of certification.

The Educational Reform Law (1971) created, among other alternatives, four types of 'supplementary education' for early school-leavers who wish either to get promotion in their work or to enter the world of work and continue their education at a higher level.

Disadvantaged groups. Action to improve the situation of children of migrant workers is similar to that taken for unemployed youth.

Democratization

The educational system does not discriminate against girls and women as regards equal opportunities in technical and vocational education. Naturally, there are various vocational programmes for which demand is significantly higher among certain groups, but this is a normal educational phenomenon. For instance, candidates for primary-teacher training institutions are usually women; candidates for mechanical technical programmes are usually men, and so forth.

Examination system

Educational legislation provides flexibility for schools to choose their own methods of evaluation as well as to introduce the credit system—although very few schools have so far adopted it.

Educational legislation encourages schools to evaluate students in several ways so as to take account of possible individual differences and recommends that the qualitative aspects of learning be given priority over quantitative aspects.

Integration strategy

The following measures are being implemented with a view to further integrating secondary education with the community, research, experimentation, policy formulation, planning, organization and evaluation.

Local communities are made aware of the types of programmes developed at secondary level and their importance to the individual, to families and socio-economic development, through mechanisms involving direct participation of students' families, industries, social groups such as parent-teacher associations and youth clubs, special school-community events (farming weeks, industrial and commercial exhibitions, etc). For many schools, however, this local community integration has not developed sufficiently.

Research and experimentation in the area of technical and vocational education is practically non-existent. The great majority of research institutions, such as universities, have not yet given priority to the area of technical and vocational education, the major cause of this situation being the lack of graduate programmes and specialists in the field concerned, and the controversy as to the real value of technical and vocational education, throughout the whole school system, as established by the Educational Reform Law (1971). The strategy is to encourage the creation, within graduate programmes in the area of education, of a major in technical and vocational education. In this respect, a graduate programme is already being developed in the area of agricultural education at the Federal University of Santa Maria, state of Rio Grande do Sul. Various other institutions also contribute with research related to technical and vocational education, but are far from producing recommendations useful for planning and developing technical and vocational education in the country.

Policy formulation and planning are becoming more decentralized, with active participation of local and state leadership in the definition of priorities for national, state and local programmes.

Despite national requirements for technical and vocational education, legislation is relatively flexible, so as to permit secondary schools to select and plan their own programmes to meet local and regional needs. Evaluation is an area which did not receive the necessary emphasis during the 1970s, but a major effort is being made by the Ministry of Education and Culture to establish a national follow-up system in respect of technical and vocational graduates that will generate basic data for policy formulation and planning in this area.

Integration at the first stage of the secondary level

General description

As shown in Figure 1, first-level instruction covers eight years' education which, at least in theory, is compulsory and free for all. It comprises grades 1 to 8, the former primary school of four years and the former four-year *ginásio* (first cycle of secondary school), encompassing approximately ages 7–14. It is also referred to as fundamental education. The term 'First Stage of Secondary Education' is therefore used in this study to indicate grades 5 to 8, which, prior to the Educational Reform Law No. 5,692/71, comprised what was called the *ginásio*, corresponding to the years of 'early adolescence' with ages ranging roughly from 11 to 14. It is best described as the upper primary level.

In spite of many difficulties that remain to be overcome in the implementation of that educational innovation, it may be safely said that primary education in Brazil has been expanded not only in duration but also as to function. A significant feature of the 1971 law is the inclusion of technical and vocational aspects of general education in the first-level curriculum. This special segment of the curriculum aims at determining pupils' aptitudes and their initiation to work experience. It is designed to introduce students to the elements of technology, to develop basic practical skills and to offer productive experience in the manipulation of tools and materials.

Unfortunately, it must be added that implementation of this education for work is far from being effective throughout the country.

Article 5 of the legal text notes that:

1. In accordance with the regulations for each educational system, the full curriculum will be divided into general education and special studies and will be organized in such a way that: (a) in First-Level Instruction, the general segment shall be exclusive in the initial grades and predominant in the final ones, (b) in Second-Level Instruction, the special instructional segment will predominate.
2. The special instructional segment of the curriculum: (a) Shall aim at the determination of aptitudes and at the initiation of work experiences in the First Level and professional qualification in the Second Level.

As far as institutional organization is concerned, there is no rigid scheme for building and equipping schools. Since first- and second-level instruction in Brazil are decentralized, each state is free to organize its school network as it desires.

There is no separation of schools for academically oriented and work-oriented learning, which by and large are provided under the same roof. However, one principle is indicated by the law as a criterion for using school buildings: the principle of economy:

> Article 3: Without detriment to other solutions which may be adopted, the educational systems will encourage, in the same school, a variety of vocational offerings integrated by a common basis and, in the same locality: (a) assembling small establishments into larger units; (b) developing co-operation and complementary relationships among educational establishments and with other social institutions, so as to take advantage of the full capacity of some and to overcome the deficiencies of others; (c) organizing inter-school centres which offer courses and services common to various establishments

In accordance with these guidelines, various types of schools were designed to offer first-level instruction: most urban schools are comprehensive institutions, some interlinked with other schools, sharing facilities such as workshops, laboratories, libraries, gymnasiums and auditoriums; others, as in the case of the Federal District, are designed to offer vocational and technical, artistic and physical education. Pupils who attend these schools come from tributary schools that provide basic general education. The schools are also encouraged to use community services in developing vocational programmes. There is no selection process at this stage.

Curricula

In 1972, the Federal Council of Education established the basic core curriculum required for all first- and second-level students. This core curriculum includes the following subjects: (a) communication and expression, with Portuguese being the basic subject content; (b) social studies; (c) science, including mathematics.

The content of these subjects is graded and broken down according to students' levels. The subjects are taught as activities, study areas and disciplines, according to the grade level of the students and their psychological development.

Added to the core curriculum is a diversified component that aims at meeting the country's cultural diversity and students' individual differences as well as the nature and characteristics of the schools. This component is chosen from a list of vocational areas suggested by the state

Council of Education. The schools may also submit other subjects for approval by the Council.

Apart from the basic core curriculum and the diversified component, which may include general and vocational education subjects, there are various other compulsory subjects, such as civics, physical education, artistic education, health programmes and religion. Religion is compulsory for the public schools, but is elective for students. The school must provide a schedule for this subject to be provided at the student's request in accordance with his religion.

As regards the vocational components that are a part of the diversified segment of the curriculum, schools may elect to offer vocational activities related to any one of the basic economic sectors: for example, agricultural techniques within the primary sector, industrial arts within the secondary sector, and commercial techniques and home economics within the tertiary sector.

There are no differences between the curricula and subjects offered to and/or required for boys and girls. Girls can take industrial arts, for instance, as boys can take home economics.

The foregoing indicates that the area for curricula planning in Brazil is three-fold: federal area, state and school. Theoretically, there could be as many curricula as there are schools, with only the compulsory part of the curriculum common to all. Schools are allowed to introduce variations in the curricula, which must, however, be approved by the state Council of Education. An example of a curriculum outline offered by those public schools which have adopted all four vocational areas is given in Table 7.

Objectives, organization and contents

The objectives of technical and vocational education at this level are to develop pupils' aptitudes and initiate them to the world of work. What is involved is not vocational training leading to a choice of occupation but an exploratory experience which provides students with an opportunity to encounter a variety of occupations in the world of work. It is an exploratory stage which helps students make a vocational choice through learning activities that enable them to express their interests and develop basic skills. For those pupils who do not expect to complete or continue their education at the upper secondary level, however, the objective is to prepare them to take up an occupation in the world of work.

As suggested by the Federal Council of Education, the content, by economic sector, in curricula planning is the following:

Primary sector: horticultural practices, basic soil-conservation practices, crop production and small animal husbandry, basic principles of

TABLE 7. Curriculum outline. School type: primary. Level: lower secondary. Section: vocational exploratory. T = theory, P = practice.

Subject group	Subjects	Periods weekly								
		5th		6th		7th		8th		
		T	P	T	P	T	P	T	P	Total
General	Portuguese	5	—	5	—	5	—	5	—	20
	Foreign language	—	—	—	—	3	—	3	—	6
	Social studies	2	—	3	—	3	—	—	—	8
	Civics	2	—	2	—	2	—	4	—	10
	Physical education	—	3	—	3	—	3	—	3	12
	Artistic education	—	2	—	2	—	2	—	2	8
	Religion	1	—	1	—	—	—	—	—	2
Basic Science	Mathematics	4	—	4	—	4	—	5	—	17
	Physical and biological sciences	2	1	2	1	2	1	2	1	12
General technical	Agriculture	1	1	—	—	1	2	1	2	8
	Industrial arts	1	1	—	—	1	2	1	2	8
	Commercial techniques	—	—	1	1	—	—	—	—	2
	Home economics	—	—	1	1	1	2	—	—	5
Total classroom periods		18		19		22		21		80
Total work practice			8		8		12		10	38
Grand total per week		26		27		34		31		118

agricultural products, industrialization, gardening practices, landscaping aspects, forestry, water conservation and use, and other rural activities.

Secondary sector: wood-working practices, basic metal-working practices, mechanics, graphic arts, leather-work, pottery, electronics, food processing, clothing, house construction, electricity and related industrial activities.

Tertiary sector: business practices, accounting, banking systems, marketing, publicity, hotel management, tourism, health and hygiene practices, homemaking, typing, nursery, transportation, communication and other services.

It is recommended that these activities be integrated into general-education subjects. For instance, agricultural activities should be related to the physical and biological sciences, business-office activities should be developed in connection with Portuguese and mathematics, and so forth. It must be said that much remains to be done in order to implement such integration. By and large the general subjects are taught separately from the vocational components of the curriculum.

Methods, materials and facilities

The methodology of teaching technical and vocational subjects is based on the learning-by-doing process through the manipulation of basic equipment, tools and instructional materials by the students under the teacher's supervision. Some schools produce their own materials for practical activities.

Brazil's most significant experience in building and equipping schools for technical and vocational education at this level was achieved under a national programme, PREMEN (Programme for Expansion and Improvement of Education), which created the so-called Work-Oriented Junior High School (Ginásio Orientado para o Trabalho—GOT). PREMEN also built a similar junior high school called Ginásio Polivalente, a multipurpose school built and staffed to offer comprehensive technical and vocational education at this level. However, as a general rule, it must be said that the majority of the primary schools do not have adequate facilities to provide a comprehensive technical vocational programme, although some are able to offer quality programmes. Therefore one cannot speak of standardization of physical facilities and equipment of schools at this level.

Local production of equipment may occur at state level, but this is the exception rather than the rule. The basic equipment and materials are furniture, tools, instruments, electric and non-electrical appliances, engines and machines, audio-visual aids, raw materials, cleaning materials, office supplies, chemical products and health unit supplies.

Differences between rural and urban areas

Rural areas as a whole are at a disadvantage compared to urban environments. As far as content is concerned, general education is practically the same in urban and rural schools, varying in accordance with the school location, which is related to the availability of qualified teachers, size of school, number and age-group of students and so forth. Technical and vocational subjects are included in the school curriculum according to local needs and school possibilities. Usually, urban schools offer more comprehensive technical and vocational programmes than rural schools.

In regard to curricular implementation, the most striking difference lies in the length of schooling, which in rural areas has not yet reached the prescribed minimum of eight years. The majority of rural schools still provide a maximum of four years of schooling for pupils ranging from 7 to 14 years of age, in a one-room type of school.

Teachers

In order to be eligible to teach technical and vocational subjects at the first stage of secondary education, candidates are required to obtain a teaching certificate in a 1,600-hour training programme established by the Federal Council of Education in its Opinion 74/1970. This programme corresponds approximately to a nine-month training period. The length of training may, however, be reduced to 800 hours, corresponding to a five-month training period in the case of candidates holding an equivalent or middle-university-level diploma related to the vocational area to be taught in the school.

General and technical teacher training are related in two ways: (a) both are provided at university level on a short-term certification basis, except for Home Economics, teachers of which are certificated through long-term undergraduate programmes of four years' duration; (b) both require approximately the same pedagogical training in areas such as the structure and organization of Brazilian education, psychology of development and learning, methodology, course planning and teaching techniques.

No data are available on in-service training programmes or the retraining of teachers. Some states may provide this type of training on a sporadic basis.

Theoretically, there are no differences between the qualification and status of general and technical vocational teachers. Both groups are required to take short-term programmes at university level; there is no discrimination in respect of salary. In practice, however, it may be that there is a concealed prejudice in favour of general-education teachers as contrasted with those engaged in a manual type of teaching. This attitude may be responsible for the lack of integration between general and vocational education, which occupy sharply separate worlds inside the same school.

Guidance

In accordance with Article 5 of Law 5.692/71, technical and vocational education at this level has a two-fold objective: it includes both the identification of pupils' aptitudes and their initiation to work. The identification of aptitudes involves recording pupils' spontaneous manifestations of preferences and interests, their personality traits, strengths and weaknesses through experiences in the school and the community under appropriate guidance techniques.

Counsellors must have qualifications at university level. However, this is an area in which much remains to be done if guidance is to become effective, especially as regards its vocational aspect.

Selection

As already noted, there are no selection procedures during this stage of secondary education nor at the end of the stage. However, a minimum attendance at workshop sessions is required for promotion from one grade to the next. Supplementary sessions are required of those students who did not reach the required minimum. In regard to students' progress in academic subjects, the criteria used relate to both achievement and attendance.

Reforms

Nowadays, great emphasis is placed on the planning of rural education, including innovations in school construction adapted to local environments and needs and curriculum planning that takes into consideration the country's socio-economic diversity, so that curricula vary in duration, content and methods. Stress is laid on the need to use non-formal education procedures adapted to each community and to qualify teachers for work in rural areas. Mass-media innovations are also being introduced at this level.

Integration at the second stage of the secondary level

General description

The second stage of secondary education, in which technical and vocational education is compulsory, includes grades 9 to 12. The 12th grade is for those students who wish to obtain the diploma of technician. Usually, this grade corresponds to a work-experience programme in a selected industry for students destined to become industrial technicians. As regards agricultural education programmes leading to the diploma of agricultural technician, the technical agricultural schools offer work experience during grades 9, 10 and 11 at the school farm or agricultural laboratory. The agricultural technician completes secondary education in three years.

The curriculum of the second stage (upper secondary level) requires a greater proportion of vocational education as compared with the general education component. Depending on the technical level, there are two major types of programmes: (a) those that aim at preparing middle-level technicians in the primary, secondary and tertiary sectors of the economy; (b) those below the technician level that aim at preparing for one specific occupation and/or for an occupational family or cluster of occupations.

Vocational programmes below the technician level are usually offered in common (general or comprehensive) secondary schools. In these programmes, vocational subjects are taught with the minimum of equipment and shop tools necessary to teach basic vocational skills. These skills can also be acquired through work-experience programmes or in vocational interschool centres, which offer vocational education subjects for students from several common secondary schools. The vocational classes in these interschool centres may be organized on certain week days at the same period and/or daily at different periods.

Industrial technical vocational programmes leading to the diploma of technician are offered by specialized technical schools supported by the federal government, by industries and by private institutions. In the technical federal schools these programmes last four years. Agricultural education programmes at the technical level are offered by specialized technical agricultural schools supported by the federal government and by state departments of education. These programmes last three years. Technical programmes in the tertiary sector are usually offered by general secondary schools and last three years.

There is no entrance requirement for any of the technical vocational programmes, unless the demand is higher than the capacity of the schools. In this case, students are required to take an examination for each type of programme.

Technical and vocational subjects are required in all secondary-school curricula, but legislation allowed the necessary time for transition from the old general-education programmes to technical and vocational programmes. At the present time (1980), it is estimated that a third of all secondary school programmes are still general in nature.

Curricula

Technical and vocational subjects are required for all students, whether they enter the world of work or higher education. Usually, students who intend to enter higher education take vocational programmes below the technician level. These programmes require a minimum of 300 hours of vocational subjects when aimed at preparation for one specific occupation and 600 hours when aimed at preparation for a family of occupations.

Collaboration with outside agencies

Technical vocational curricula are normally developed without extensive collaboration by other agencies, except for technical industrial programmes leading to a diploma of technician. In this case, the 12th grade corresponds to a supervised work experience in a selected industry. There are, of course, several schools that develop their curricula in collaboration with other agencies, but the proportion of these schools is not significant when compared with the school system as a whole. In spite of the flexibility the legislation provides for co-operative curricular development, schools have not done a great deal in this direction.

Objectives, organization and contents

The objectives of technical and vocational programmes are:

Technician programmes: to prepare students to enter the world of work as middle-level technicians in an occupation that requires this professional or technical level.

Programmes below technician level: to prepare students to enter the world of work in a specific occupation or in a group of related occupations. The vocational programmes based on the group-of-occupations approach also prepare students to enter higher education.

The organization of technical and vocational programmes and subjects in the school curricula is based on the policy-formulation mechanism shown in Table 6. In other words: the Federal Council of Education approves technical and vocational programmes with a minimum of subjects. The schools transform these subjects into disciplines (courses) and activities when planning their curricula. The state Council of Education may approve other subjects to meet local and regional needs. The contents of each discipline derived from each subject are identified by the vocational teacher.

The ratio between theoretical and practical content in technical programmes is approximately 1 : 2. For example, in a technical programme with a total of 3,000 hours, it is recommended that, other things being equal, 1,000 hours be devoted to general education, 1,000 to technical knowledge and 1,000 to practical skills. However, since the duration of the present technical programmes varies considerably among schools in terms of total hours, and since curriculum outlines do not specify the number of hours to be devoted to practical work, it is rather difficult to estimate the average for the whole country. Moreover, the extent of practical (skills) content varies among different types of technical and vocational programmes, which may mean a significant error in any average estimated for the entire school system.

The curriculum outlines exemplified in the following pages provide an overall picture of different types of the technical vocational programmes being developed in the country. However, it must be said that these programmes may differ between the state and local school systems.

Table 8. Curriculum outline. School type: comprehensive. Level: upper secondary. Section: agriculture.

Subject group	Subjects	Periods weekly										
		1st year			2nd year			3rd year				
		Class.	Lab.	Wsh.	Class.	Lab.	Wsh.	Class.	Lab.	Wsh.	Total	%
	Portuguese	2			3			3			8	
	History	2	—	—	—	—	—	—	—	—	2	
	Geography	—	—	—	2	—	—	—	—	—	2	
	Civics	2	—	—	—	—	—	—	—	—	2	
	Arts	2	—	—	—	—	—	—	—	—	2	
	Foreign language	—	—	—	—	—	—	2	1	—	3	
	Physical education	—	2	—	—	2	—	—	2	—	6	31.2
	Mathematics	2	—	—	3	—	—	3	—	—	8	
	Physics	—	—	—	2	—	—	2	1	—	5	
	Chemistry	2	1	—	2	1	—	—	—	—	6	
	Biology	2	1	—	2	1	—	—	—	—	6	
	Drawing	1	2	—	—	—	—	—	—	—	3	35.0
	Agric. occupations	—	—	—	1	2	—	—	—	—	3	
	Agriculture	2	1	—	2	2	—	3	—	1	11	
	Animal husbandry	—	—	—	2	1	—	3	—	1	7	
	Ag. econ. and adm.	—	—	—	3	—	—	2	1	—	6	33.8
Total classroom periods		17			22			18			57	
Total lab. periods			7			9			5		21	
Total workshop periods										2	2	
Total practice				7			9		7		23	
Grand total per week			24			31			25		80	

Mechanisms for adapting curricula

Educational legislation provides schools with the necessary flexibility to change their curricula so as to meet local and regional needs on a permanent basis. Besides the national core curricula, the relevant legislation approves a diversified part for all curricula to be determined by state and local school systems. The contents of the national core curriculum subjects are also determined by the schools.

Work-study programmes

Work studies or work experience programmes are developed within both well-equipped schools and industry. These experiences are educationally recognized when students complete at least 10 per cent of the total hours

Table 9. Curriculum outline. School type: comprehensive. Level: upper secondary. Section: administration.

Subject group	Subjects	Periods weekly										
		1st year			2nd year			3rd year				
		Class.	Lab.	Wsh.	Class.	Lab.	Wsh.	Class.	Lab.	Wsh.	Total	%
General	Portuguese	3	—	—	3	—	—	2	—	—	8	
	History	—	—	—	2	—	—	—	—	—	2	
	Geography	2	—	—	—	—	—	—	—	—	2	
	Civics	—	—	—	2	—	—	—	—	—	2	
	Arts	2	—	—	—	—	—	—	—	—	2	
	Social & polit. organ.	—	—	—	1	—	—	—	—	—	1	
	Physical education	—	2	—	—	2	—	—	2	—	6	
	Foreign language	2	1	—	2	1	—	—	—	—	6	36.7
Basic science	Mathematics	3	—	—	2	—	—	2	—	—	7	
	Physics	2	—	—	2	—	—	—	—	—	4	
	Chemistry	—	—	—	—	—	—	2	—	—	2	
	Biology	—	—	—	2	—	—	—	—	—	2	18.9
Technical	Technical writing	2	—	—	2	—	—	2	—	—	6	
	Econ. history	—	—	—	2	—	—	—	—	—	2	
	Econ. geography	—	—	—	—	—	—	2	—	—	2	
	Adm. occupations	—	—	—	—	—	—	2	1	—	3	
	Administration	4	—	—	2	1	—	2	1	—	10	
	Business organ.	—	—	—	2	2	—	2	—	—	6	
	Accounting	3	—	—	—	—	—	—	—	—	3	
	Legislation	—	—	—	—	—	—	3	—	—	3	44.4
Total classroom periods		23	—	—	24	—	—	19	—	—	66	
Total lab. periods			3			6			4		13	
Total workshop periods				—			—			—	—	
Total practice			3			6			4		13	
Grand total per week			26			30			23		79	

devoted to vocational subjects, which makes them eligible for the diploma of technician. Schools can naturally plan work study or experience programmes as elective curricular activities. However, for a certificate of secondary education the duration of such activities is not specificed.

In the case of state general secondary schools located in the major cities, the 'work stations' are identified by the state Department of Education through the Service for Integration School-Enterprises (employers). The schools receive a list of enterprises (firms) and select interested students to participate in the programme. The final selection of candidates is made by the enterprises.

Table 10. Curriculum outline. School type: technical. Level: upper secondary. Section: mechanics.

Subject group	Subjects	Periods weekly									
		1st year		2nd year		3rd year		4th year			
		theory	practice	theory	practice	theory	practice	theory	practice	Total	%
General	Portuguese	2	2	2	2	2	1	—	—	11	
	English	1	2	1	1	—	—	—	—	5	
	History	2	—	—	—	—	—	—	—	2	
	Geography	2	—	—	—	—	—	—	—	2	
	Social & polit. org.	1	—	—	—	—	—	—	—	1	
	Civics	2	—	—	—	—	—	—	—	2	
	Physical education	—	3	—	3	—	3	—	2	11	
	Arts	—	2	—	—	—	—	—	—	2	
	Regional studies	2	—	—	—	—	—	—	—	2	21.1
Basic Science	Mathematics	4	—	3	—	3	—	—	—	10	
	Physics	2	2	3	—	4	—	—	—	11	
	Chemistry	1	—	1	1	1	1	—	—	5	
	Biology	2	—	—	—	—	—	—	—	2	
	Drawing	—	—	—	3	—	4	—	—	7	25.0
Technical	Hygiene & acc. prev.	2	—	—	—	—	—	—	—	2	
	Organization & norms	—	—	3	—	—	—	—	—	3	
	Metrology	1	—	—	—	—	1	—	—	2	
	Mechanics	—	—	1	1	—	—	—	—	2	
	Resis materials	—	—	—	—	1	1	—	—	2	
	Machines	—	—	—	—	3	—	—	2	5	
	Technology	—	—	2	1	2	—	—	—	5	
	Electricity	—	—	—	—	—	—	2	—	2	
	Shop planning	—	—	—	—	—	—	1	1	2	
	Mech. production	—	—	—	5	—	5	—	5	15	
	Laboratory	—	—	—	—	—	—	—	3	3	
	Work experience	—	—	—	—	—	—	—	24	24	47.9
Total classroom periods		24		16		16		3		59	
Total practice			11		17		16		37	81	
Grand total per week		35		33		32		40		140	

In cases where the schools are located far from the cities, their educational guidance services are responsible for selecting, planning, supervising and evaluating the work-study programmes. Where schools do not have guidance specialists, work study programmes are coordinated by the vocational teacher.

There are some work-study programmes where students receive financial assistance for transportation and other small expenses, depending

Table 11. Curriculum outline. School type: technical. Level: upper secondary. Section: electricity.

Subject group	Subjects	Periods weekly									
		1st year		2nd year		3rd year		4th year			
		theory	practice	theory	practice	theory	practice	theory	practice	Total	%
General	Portuguese	2	2	2	2	2	1	—	—	11	
	English	1	2	1	1	—	—	—	—	5	
	History	2	—	—	—	—	—	—	—	2	
	Geography	2	—	—	—	—	—	—	—	2	
	Social & polit. org.	1	—	—	—	—	—	—	—	1	
	Civics	2	—	—	—	—	—	—	—	2	
	Physical education	—	3	—	3	—	3	—	2	11	
	Arts	—	2	—	—	—	—	—	—	2	
	Regional studies	2	—	—	—	—	—	—	—	2	28
Basic Science	Mathematics	4	—	3	—	3	—	—	—	10	
	Physics	2	2	3	—	4	—	—	—	11	
	Chemistry	1	—	1	1	1	1	—	—	5	
	Biology	2	—	—	—	—	—	—	—	2	
	Drawing	—	—	—	5	—	—	—	—	5	25
Technical	Hygiene & acc. prev.	2	—	—	—	—	—	—	—	2	
	Organization & norms	—	—	3	—	—	—	—	—	3	
	Electricity	1	—	2	2	2	1	—	—	8	
	Elec. measures	—	—	—	—	1	1	1	1	4	
	Elec. machines	—	—	—	—	3	—	—	3	6	
	Mechanics	—	—	—	—	1	1	—	—	2	
	Electronics	—	—	—	—	—	—	2	—	2	
	Elec. projects	—	—	—	—	—	—	—	2	2	
	Applied electricity	—	—	—	3	—	5	—	2	10	
	Work experience	—	—	—	—	—	—	—	24	24	47
Total classroom periods		24		15		17		3		59	
Total practice			11		17		13		34	72	
Grand total per week		35		32		30		37		134	

on the enterprise's staff responsible for the programme. Graduates from several technical schools are employed after completing the work-study or experience programme.

Materials and methods

The pronounced emphasis on the production and use of educational technology (methods and materials) for technical and vocational education started in 1973 as a result of the Educational Reform Law (1971). Several projects were and are being developed by the Ministry of Education and Culture (MEC) through the following agencies: National Centre for the Development of Technical Vocational Education Personnel (CENAFOR), University for Work of Minas Gerais (UTRAMIG), Brazilian Centre for School Construction and Equipment (CEBRACE), Programme for the Improvement of Teaching (PREMEN), Getulio Vargas Foundation (FGV) and Carlos Chagas Foundation (FCC).

The products (materials and methods) of these projects are being tested and used by many schools in different states. These projects are:

Methodology for Training Students to Make Vocational Decisions (CENAFOR). The objective of this methodology was to develop students' ability to make a rational decision regarding a vocation. The project consisted of three types of material: (a) definition of the methodology, (b) students' manual and (c) Specialist Guidance Manual. Educational guidance specialists of all twenty-six state Departments of Education in the country were trained in the use of these materials.

Methodology of Vocational Training by Objectives through Modular Systems (UTRAMIG). This training methodology was conceived for the preparation of telecommunication technicians through a system comprising the following four modules: Radio techniques (300 hours) which prepares the assistant technician in Electronics; TV (VHF-UHF) (300 hours) which prepares the assistant technician in Telecommunications; Telephony techniques (300 hours) which prepares the assistant technician in Telephony; and the Operation and Maintenance of Telecommunication Systems (300 hours) which, combined with the Radio, TV and Telephony modules, prepares middle-level technicians in Telecommunication. This modular training system was tested for implementation in 1980 in several technical industrial schools.

Problem Solving in Business Administration (FCC). This material was prepared for use of students in the business administration vocational programme of general secondary schools. It consists of four instructional games and two evaluative guides. Each of the instructional games has special materials for the students and for the vocational teacher. The evaluative guides consist of a self-evaluative exercise to be used by the student and an orientation guide for the teacher. State Departments of Education were informed of the availability of the material and are receptive to their use in the business administration programmes. It is expected that in 1980 these materials will be in use by the local school systems.

Production of Instructional Materials for the Vocational Cluster Programmes (CEBRACE, FGV). The Ministry of Education and

> Culture requested the Brazilian Centre for School Construction and Equipment (CEBRACE) (1975) to develop vocational programme guidelines for each of the ten occupational families or clusters approved by the Federal Council of Education. These programmes were developed by different groups of specialists and distributed to teacher training agencies and universities, as well as to all state Departments of Education. They were reviewed in 1977 by the Getulio Vargas Foundation (FGV), which surveyed the objectives and methodology of teaching each vocational subject. The foundation also produced guidelines for the vocational training of graduates wishing to complete their vocational training so as to obtain a diploma of technician in a related technical field. These materials had a significant impact on the general school system with regard to the implementation of less costly vocational programmes based on the cluster concept approach in technical vocational education.

As to the standardization and local production of vocational materials, few schools and training centres are involved in this area. However, a major effort is being made by the Ministry of Education and Culture (MEC) to support such agencies as CENAFOR and CEBRACE in developing materials and methods for technical and vocational education. Private enterprises have not yet shown interest in the production of such materials.

Physical facilities

Planning for maximum utilization

The Brazilian Centre for School Construction and Equipment (CEBRACE) is the institution responsible for providing plans for school construction at national level, including laboratory and workshop layouts, as well as specifications of equipment and tools for technical and vocational programmes. This institution has already published workshop lay-outs for each of the ten occupational or vocational cluster programmes approved by the Federal Council of Education.

The Educational Reform Law (1971) provides alternatives for the maximum use of facilities, such as the use of Interschool Centre workshops by students from general secondary schools. In general, state and private schools lack adequate facilities for technical and vocational programmes. On the other hand, specialized industrial technical schools have adequate facilities (workshops and laboratories) functioning at full capacity.

The present directives for planning technical and vocational education facilities emphasize the need for maximum use to be made of physical spaces through economic modular systems and equipment that can minimize the investment necessary for implementing technical and vocational programmes in the entire school system. The Ministry of Education and Culture (MEC) allocated Cr%50 million (1978) for acquisition of equipment and improvement of school facilities, and Cr%146 million in 1979.

Local production of equipment

Secondary schools do not produce educational equipment for school workshops at the first stage of secondary education. However, some federal technical schools produce tools for the industrial community and for use in their own workshops.

Differences between rural and urban areas

As indicated by the Educational Reform Law (1971), the planning of technical and vocational programmes must be adequate to meet the needs and conditions of the local communities. Thus, vocational teachers are responsible for determining contents and methodology of teaching appropriate to urban, suburban and rural settings. However, several general education programmes are still developed with the same contents, whether the schools are located in urban or rural areas. Nevertheless, the trend is to adjust training methodology and contents to meet the needs of students in each community. This is taking place through the use of more rational criteria for selecting technical and vocational programmes and through feedback data collected from vocational graduates.

Teachers

Training of general and technical teachers

In accordance with the Educational Reform Law (1971), secondary-school teachers, whether of general or vocational subjects, are to be trained in regular four-year training programmes offered by universities and other authorized training agencies.

General education teachers have been trained at college level since the beginning of the twentieth century. On the other hand, the great emphasis on vocational teacher training at college level came about with the Educational Reform Law.

Legislative approval was given for two special types of vocational teacher training programmes as one of the alternatives to implement short-term vocational programmes. Programmes for college graduates require 600 hours of pedagogical training for graduates of technical colleges in such areas as engineering, agriculture, economics, administration, nutrition, etc. Programmes for middle-level technicians require a minimum of 1,080, 1,280 and 1,480 hours of training to teach one, two or three subjects, respectively. Training includes basic science, technical contents and pedagogical training.

In addition to the above programmes, universities were authorized by the Federal Council of Education to initiate (1977) regular four-year vocational teacher-training programmes in all vocational fields, with a minimum duration of 2,500 hours. Approximately 3,000 students entered these programmes in 1978. The programmes are developed on the basis of a credit system whereby students teach and study in alternating periods.

The basic difference in the training of general education and vocational teachers is that the prospective general education teacher takes a university entrance examination and studies four years to obtain a teaching certificate. The vocational teacher has an opportunity to receive the same teaching certificate taking only pedagogical disciplines because of the credit system, which takes account of previous college training and experience.

In-service programmes

The objectives of in-service training programmes are to upgrade teachers and develop specialization so as to improve the quality of learning in schools. In some cases, these programmes provide for the acquisition of teaching certificates.

The organization of in-service training programmes may differ from one institution to another as regards the number of credit hours required and/or duration (60 to 300 hours: upgrading programmes vary from 60 to 120 hours and specialization programmes from 160 to 300).

Upgrading programmes are usually intended for school directors, secretaries, guidance personnel and vocational teachers and specialization programmes for graduate teachers and educational specialists. The latter programmes develop knowledge in one specific area.

The contents of these programmes may include technical specialization and teaching methodology. Training may be provided through regular programmes in a university or technical education centre or through modules involving an individualized approach or through a combination of different methods. The most common method is the regular class teaching programme.

Qualifications and status

The differences between the qualifications of general and vocational teachers have been discussed. As to status, there is no significant difference. Both types of teachers obtain the same kind of teaching certificate. Teachers in federal-supported technical schools receive higher salaries.

Continuing training

Legislation provides mechanisms and incentives for continuing teacher training. There is no system for teacher training in industry. Vocational teachers in technical industrial schools have usually had experience in industry.

Additional personnel required

The personnel required for the secondary school system are:

At school level: school administrator (director, vice-director), school secretary, school supervisor and educational guidance specialists. There are no vocational supervisors.

At state level: curriculum team, supervisor's team, educational guidance specialists and planning and evaluation teams. These technical teams do not as a rule include technical or vocational educators. The general education specialists are responsible for technical and vocational education at state level, except in one or two cases.

Guidance

It is estimated that 30 per cent of secondary schools offer educational guidance to students. There is relatively little vocational or occupational guidance. Vocational-guidance specialists in Brazil are practically nonexistent, although there is a pronounced need for this type of service. Facilities for guidance services are not adequate to provide efficient guidance for all those students who need it, although some schools provide a relatively satisfactory guidance service.

Materials for vocational or occupational guidance are somewhat scarce. Occupational guidance was approved by the Federal Council of Education as a required subject for the ten occupational families or clusters in 1975. These occupational-guidance programmes are now being developed in some schools under the responsibility of the educational guidance specialist and with the collaboration of the vocational teacher.

The Ministry of Labor and a few other institutions are developing valuable material that can be used for occupational guidance of students.

Selection

Requirements for entry into the world of work depend on the employer concerned. Some positions call for a diploma of technician, and employers sometimes interview prospective candidates for certain types of jobs. Examinations for entry into private firms are not common but are usually required for employment in the public sector. A curriculum vitae is normally required when applying for a position.

Entrance requirements in respect of higher education are the same for all students who have completed secondary education, whether from the general or technical side. Examination subjects are Portuguese, physics, mathematics, chemistry and biology.

Transition between school and work

Occupational guidance and placement

Occupational guidance is generally provided by the educational guidance service of the schools. This activity is somewhat limited by the lack of guidance materials about the world of work. At primary (lower secondary level), only some 30 per cent of schools have educational guidance service units within their organizational structure. At the secondary (upper secondary) level, guidance units are found in approximately 35 per cent of schools.

Placement is another school activity that is almost non-existent, except for the technical industrial schools, which usually have a special school-work service programme which co-ordinates work-experience training of students who complete the 11th grade. This programme is required for those students seeking a diploma of technician. Students in technical industrial schools who do not participate in such programmes in a selected industry receive a certificate on completion of secondary education and can either enter higher education or seek positions that do not require the diploma of technician.

Guided employment experience

As mentioned above, the mechanism that provides guided employment experience is the 'School-Work' Service that was set up in industrial technical schools, agricultural schools and most recently in State Departments of Education (1975).

An educational guidance specialist is usually in charge of this activity. The Federal Council of Education, when approving a minimum core curriculum for ten cluster vocational programmes (1975) included as a subject 'occupation guidance' for the purpose of guiding students in selecting an occupation within each cluster or family of occupations.

Relations between schools and employers

The following measures were taken to improve the relations between schools and employers:

Allocation of financial resources for work experience programmes in federal technical schools and in state secondary schools.
Training of human resources to co-ordinate and implement programmes at state and local levels.
Production and distribution of guidance materials.
Legislation providing flexibility to schools to develop vocational and technical programmes in co-operation with employers.

Measures to facilitate transition

Although the Educational Reform Law (1971) provides alternatives for schools to adopt the credit system, very few of them have tried to use this curricular mechanism to facilitate the transition between school and work. One of the major problems that impedes adoption of the credit system is the use of the traditional educational structure, which facilitates registration, teacher schedules and other school activities.

In conclusion, it may be said that there are no strong incentives towards experimenting with flexible school scheduling that allows the development of work-experience programmes as an elective curricular activity for credit.

Conclusion

Institutions such as the World Bank and the Interamerican Bank of Development (IBD) have had project agreements with the government of Brazil to improve technical and vocational education. These projects involved school construction, vocational teacher training and technical assistance to state Departments of Education. One of the major problems is the maintenance of schools by the states after school construction projects are completed.

In general, educational policies differ from those established by national enterprises. While educational policies are centred on the needs of the individual, enterprise policies focus on production needs. There is, however, a trend towards common training goals between educational and private business. Educational policies are claiming more participation by enterprises in defining the objectives of technical and vocational education, and enterprises are becoming aware of the individual's social needs for improving the efficacy of their training systems.

With regard to international information, the translation of various technical and vocational education textbooks and other materials for distribution to universities and other educational institutions would be of definite value.

Brazil is a country that varies considerably in terms of socio-economic conditions and educational contexts. Thus, the quality of technical and vocational education and the ways in which such education develops may differ among states and local school systems.

Finland

Asta Sarjala

The past decade has seen the completion of the first phase of the reform of the Finnish educational system. During the years 1972–79 Finland moved by degrees to a nine-year unified comprehensive school. In connection with the implementation of reform at this educational level, planning was begun for the reform of the next, or secondary, level, the central objectives being, on the one hand, to broaden the base for vocational education, and, on the other, to open a channel to higher education through vocational education. So far, the primary channel to higher education has been the three-year general education provided by the upper secondary school. The reform attempts to make it possible for students of vocational institutes to apply for higher education in their fields. Another objective is to increase the number of student places so that, in principle, every person who has completed the comprehensive school would have an opportunity to continue his or her education either in a vocational institute or in upper secondary school. See Figure 1.

In this case-study, an effort has been made to answer all the questions. However, the answers vary in depth, depending on which matters are currently under consideration in Finland or which would seem to have undergone the greatest development (for example, the unified-application system and self-guided study).

As stated above, the reform of secondary education is still in the planning stage. The aim is that the reform should be implemented during 1981–83. For this reason, we have discussed only those parts of the new system that have been officially approved. Owing to the multifaceted aspects of the secondary education system, one aspect, technical education, has been chosen for detailed examination and to serve as an example. Thus the scheduling of classes and hours of the technical institute have been used to explain the system in operation. It is necessary to stress that the aims of the compulsory, comprehensive school and the technical institute, which is meant to train the student for a vocation, are different. For this reason, they do not form an integrated system of cumulative syllabuses.

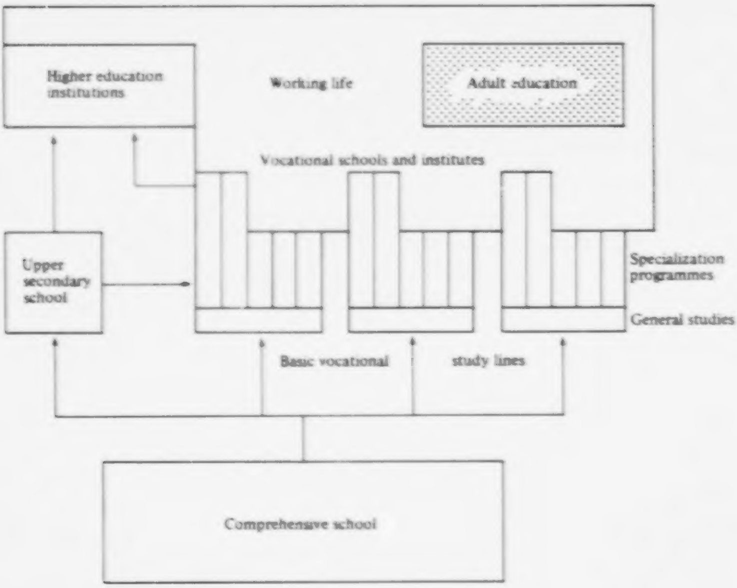

Higher education institutions
Working life
Adult education
Vocational schools and institutes
Upper secondary school
Specialization programmes
General studies
Basic vocational
study lines
Comprehensive school

FIG. 1. New comprehensive school system.

Profile of second-level education

Structure of the system

The compulsory school in Finland is a nine-year comprehensive school. All children enter compulsory school during the calendar year in which they reach the age of 7. The school is divided into a six-year lower stage and a three-year upper stage.

The upper secondary school is a three-year general educational establishment whose primary function is to prepare young people to enter levels of higher education, despite the fact that in practice less than half of those who have finished the upper secondary school will have an opportunity to enter one of the higher education institutions. Pupils are selected for entrance to upper secondary schools on the basis of their grade point average in the certificate presented upon completion of the comprehensive school. Studies in the upper secondary schools end in the matriculation examination. This examination is usually required in addition to the certificate of completion of upper secondary school studies as a prerequisite for higher education.

There are two types of vocational institutions: vocational schools that provide training in skilled manual work and vocational institutes that

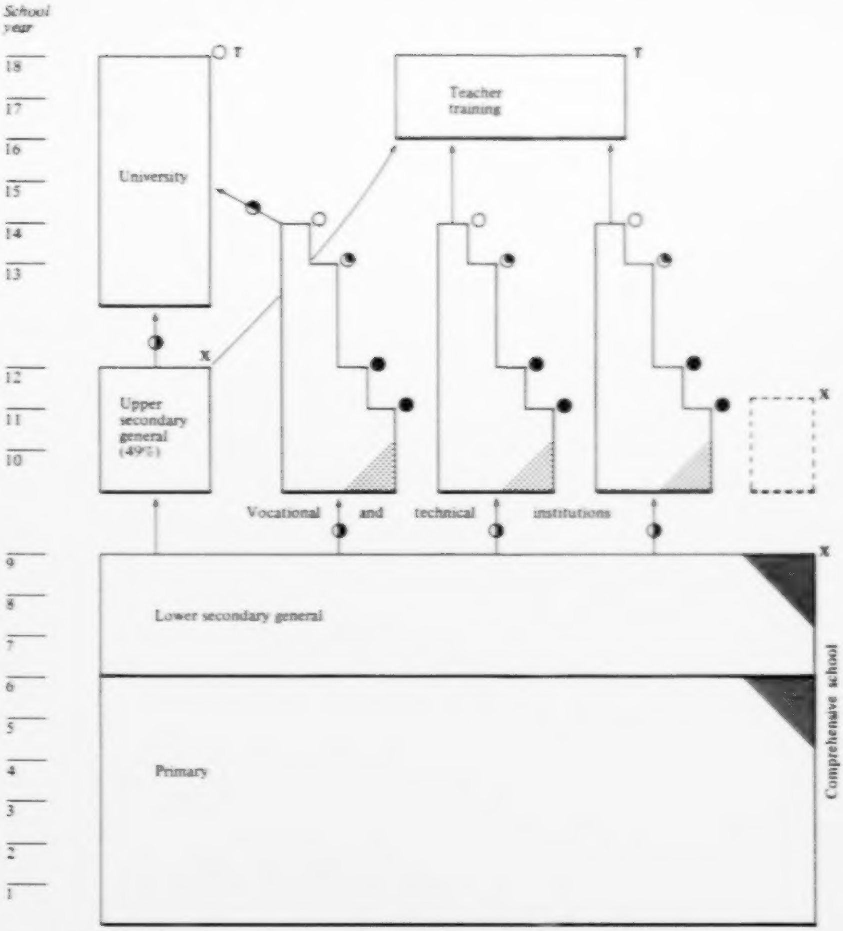
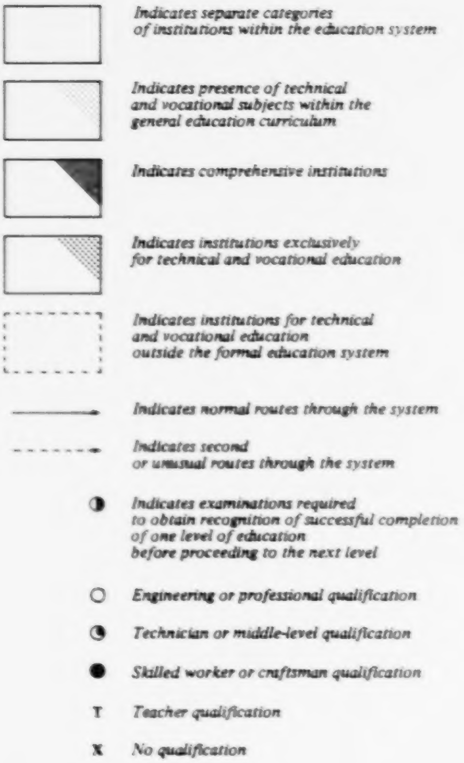

School year
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
T
T
Teacher training
University
X
Upper secondary general (49%)
X
Vocational and technical institutions
X
Lower secondary general
Primary
Comprehensive school

FIG. 2. The national educational system of Finland (see Key overleaf).

primarily prepare students for managerial tasks and planning. In vocational education, selection criteria vary according to field of study and level of education and include the pupil's grade-point average on his comprehensive school certificate, his performance in entrance examinations and tests, his age and state of health, preliminary training completed and so on.

Planning for the execution of the reform in secondary education has already begun. The contents of the reform will be described later in this case-study.


Indicates separate categories of institutions within the education system
Indicates presence of technical and vocational subjects within the general education curriculum
Indicates comprehensive institutions
Indicates institutions exclusively for technical and vocational education
Indicates institutions for technical and vocational education outside the formal education system
Indicates normal routes through the system
Indicates second or unusual routes through the system
◑ Indicates examinations required to obtain recognition of successful completion of one level of education before proceeding to the next level
○ Engineering or professional qualification
◔ Technician or middle-level qualification
● Skilled worker or craftsman qualification
T Teacher qualification
X No qualification

Key to Figure 2

Secondary-level enrolment

In 1978 Finland had a total of 4,900 comprehensive schools, including 4,000 at lower level and 600 at upper level, 250 remedial and other special schools, and 50 practice-teaching schools. There were 20 private schools substituting for public comprehensive schools. In the same year, upper secondary schools numbered 450 and vocational institutions 560. In 1978, 640,000 pupils were enrolled in comprehensive schools, 105,000 in upper schools and 140,000 in vocational institutions.

Percentage of the total age-group enrolled in secondary educational institutions: upper secondary general, 46; vocational education, 76.6. Ratio of boys to girls in completing secondary education: upper secondary general, 39 per cent boys and 61 per cent girls; vocational education 55 per cent boys, 45 per cent girls.

Percentage ratio of students to teachers was: primary, 20.5; lower secondary general, 17.5; upper secondary general, 19.6.

Financial situation

The funding of educational institutions is undertaken by the state and municipal or private sources. The comprehensive schools are municipal institutions in which an average of 70 per cent of recurrent costs are paid by the state. The upper secondary schools have been brought within the municipal educational system, and an average of 85 per cent of their recurrent costs are paid by the state. The state operates about 30 per cent of the vocational education institutions, about 48 per cent are under municipalities or federations of municipalities, and about 22 per cent are privately owned. The state covers an average of 75 per cent of the recurrent cost of vocational institutions. In recent years, about 18 per cent of the state budget has been allocated to education and culture. (1978: 18.4 per cent). Figure 7 shows the distribution of government funds in the 1978 budget, and Figure 8 shows the distribution of funds granted to the Ministry of Education in the same year.

Policy of secondary education: its formulation and trends

Underlying philosophy

On 30 May 1974, the Council of State reached an initial decision concerning the principles governing the planning and development required to link the training given in upper secondary schools and in vocational institutions with the education given in the comprehensive school and the institutions of higher learning. This decision provided that:

1. Vocational education (which includes technical education in Finland) should be developed so as to become an alternative channel to the upper secondary school, both channels leading to higher education, taking into account the requirements of, and changes in, the job market.
2. The comprehensive school should be developed so that successful completion results in eligibility for continued studies in the upper secondary school, in vocational institutions, and in education offered in other institutions.
3. If the basic qualification (i.e. completion of the comprehensive school) does not provide a sufficient general education base for institute-level vocational education, the problem will not be solved by raising the level of entrance requirements for these institutions, but rather by raising the level of primary education through the improvement of curricula and teaching methods. With this in mind, preparations are

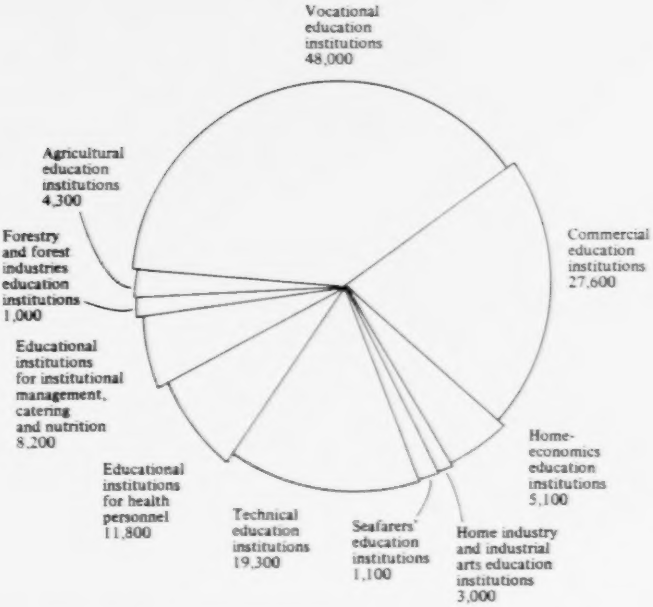


FIG. 3. Pupil enrolments at vocational education institutions subordinate to the National Board of Vocational Education.

being made to include a pre-school class in the comprehensive school. At the same time, due care is being taken that the content of the comprehensive school curricula secures the manifold development of personality.

4. Vocational studies based on completion of the comprehensive school should be organized on a broad basis. After a common period of general study, each specialisation should proceed along different lines. During the period of common study, the content common to all the programmes of each basic line will be taught in addition to general education subjects.
5. The upper secondary school should be developed as a three-year general educational system so that the first school year forms a general period, after which pupils may continue their studies in either the upper secondary school or in vocational institutions.
6. Within the same field, sufficient quotas should be reserved in all fields of study in institutions of higher education and vocational institutions requiring graduation from the upper secondary school for those who have completed institute-level degree programmes either in their entirety or those parts necessary for continued study.

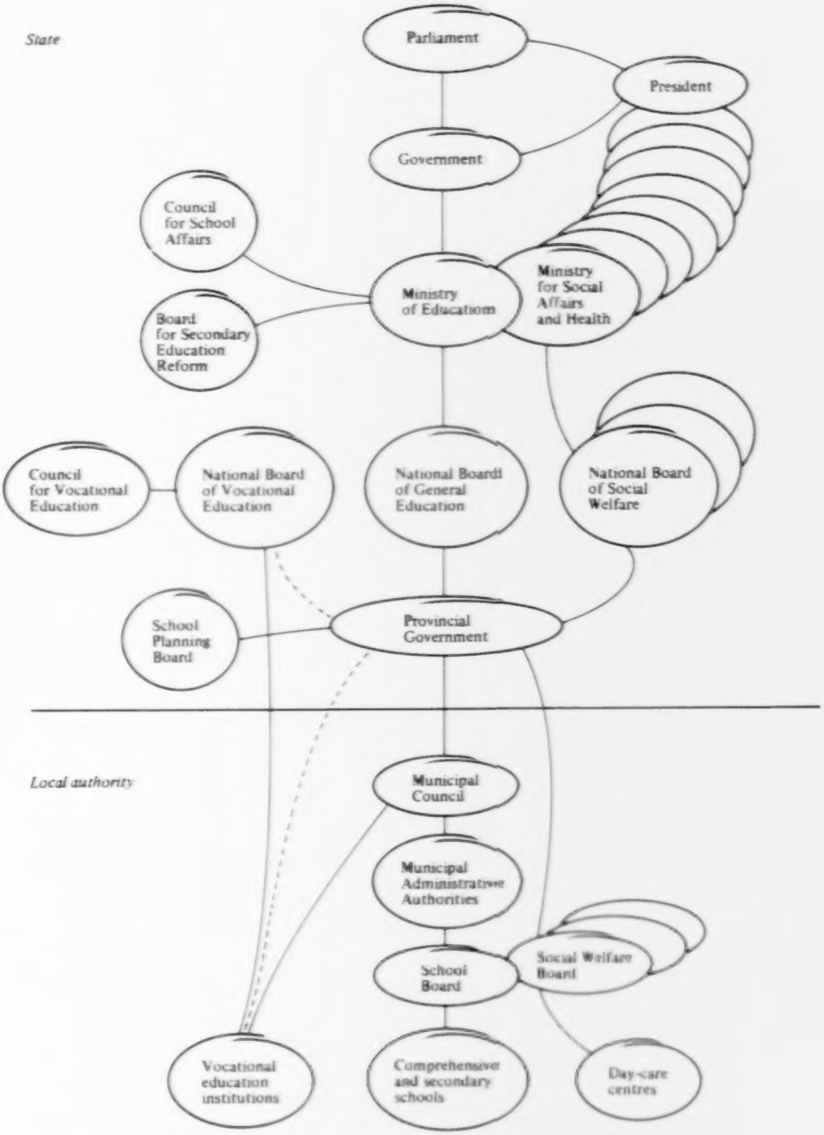

State
Parliament
President
Government
Council for School Affairs
Ministry of Education
Ministry for Social Affairs and Health
Board for Secondary Education Reform
Council for Vocational Education
National Board of Vocational Education
National Board of General Education
National Board of Social Welfare
School Planning Board
Provincial Government
Local authority
Municipal Council
Municipal Administrative Authorities
School Board
Social Welfare Board
Vocational education institutions
Comprehensive and secondary schools
Day-care centres

FIG. 4. The administrative organization of the school system in Finland.

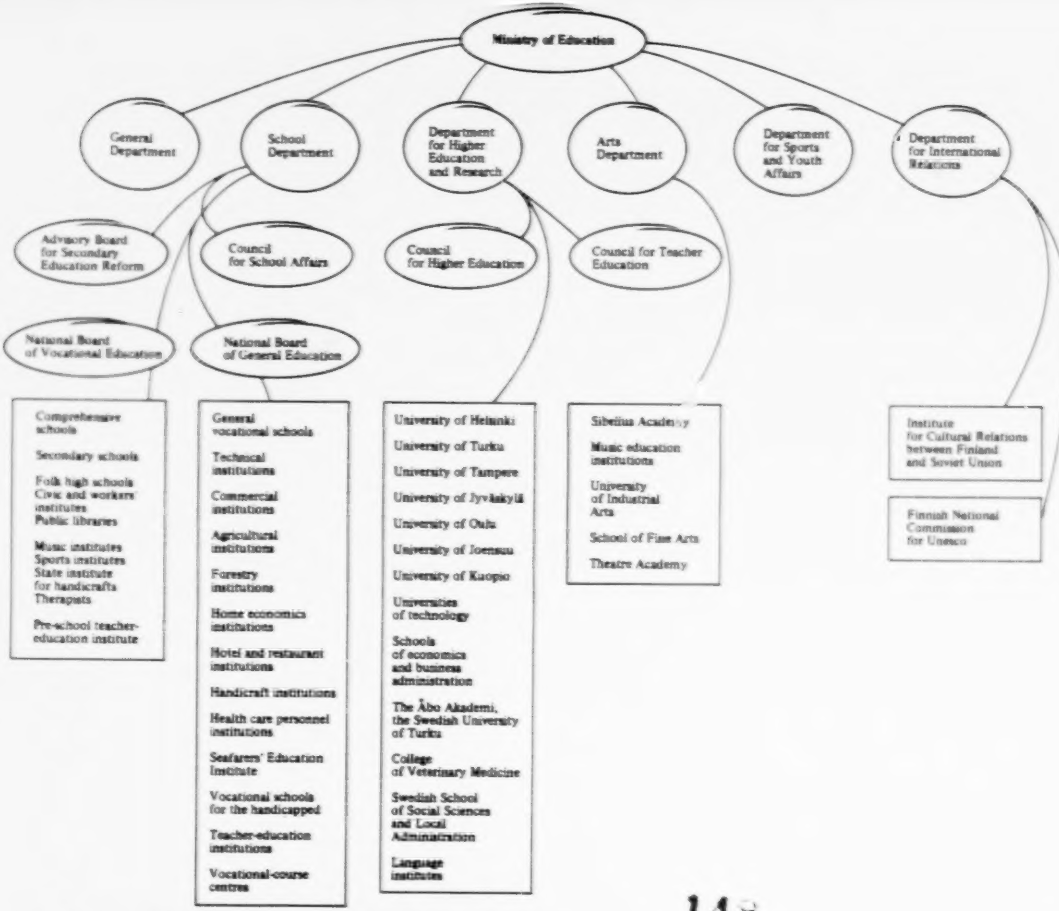

Ministry of Education
General Department
School Department
Department for Higher Education and Research
Arts Department
Department for Sports and Youth Affairs
Department for International Relations
Advisory Board for Secondary Education Reform
Council for School Affairs
Council for Higher Education
Council for Teacher Education
National Board of Vocational Education
National Board of General Education
Comprehensive schools
Secondary schools
Folk high schools
Civic and workers' institutes
Public libraries
Music institutes
Sports institutes
State institute for handicrafts
Therapists
Pre-school teacher-education institute
General vocational schools
Technical institutions
Commercial institutions
Agricultural institutions
Forestry institutions
Home economics institutions
Hotel and restaurant institutions
Handicraft institutions
Health care personnel institutions
Seafarers' Education Institute
Vocational schools for the handicapped
Teacher-education institutions
Vocational-course centres
University of Helsinki
University of Turku
University of Tampere
University of Jyväskylä
University of Oulu
University of Joensuu
University of Kuopio
Universities of technology
Schools of economics and business administration
The Åbo Akademi, the Swedish University of Turku
College of Veterinary Medicine
Swedish School of Social Sciences and Local Administration
Language institutes
Sibelius Academy
Music education institutions
University of Industrial Arts
School of Fine Arts
Theatre Academy
Institute for Cultural Relations between Finland and Soviet Union
Finnish National Commission for Unesco

FIG. 5. The school system in Finland in detail.

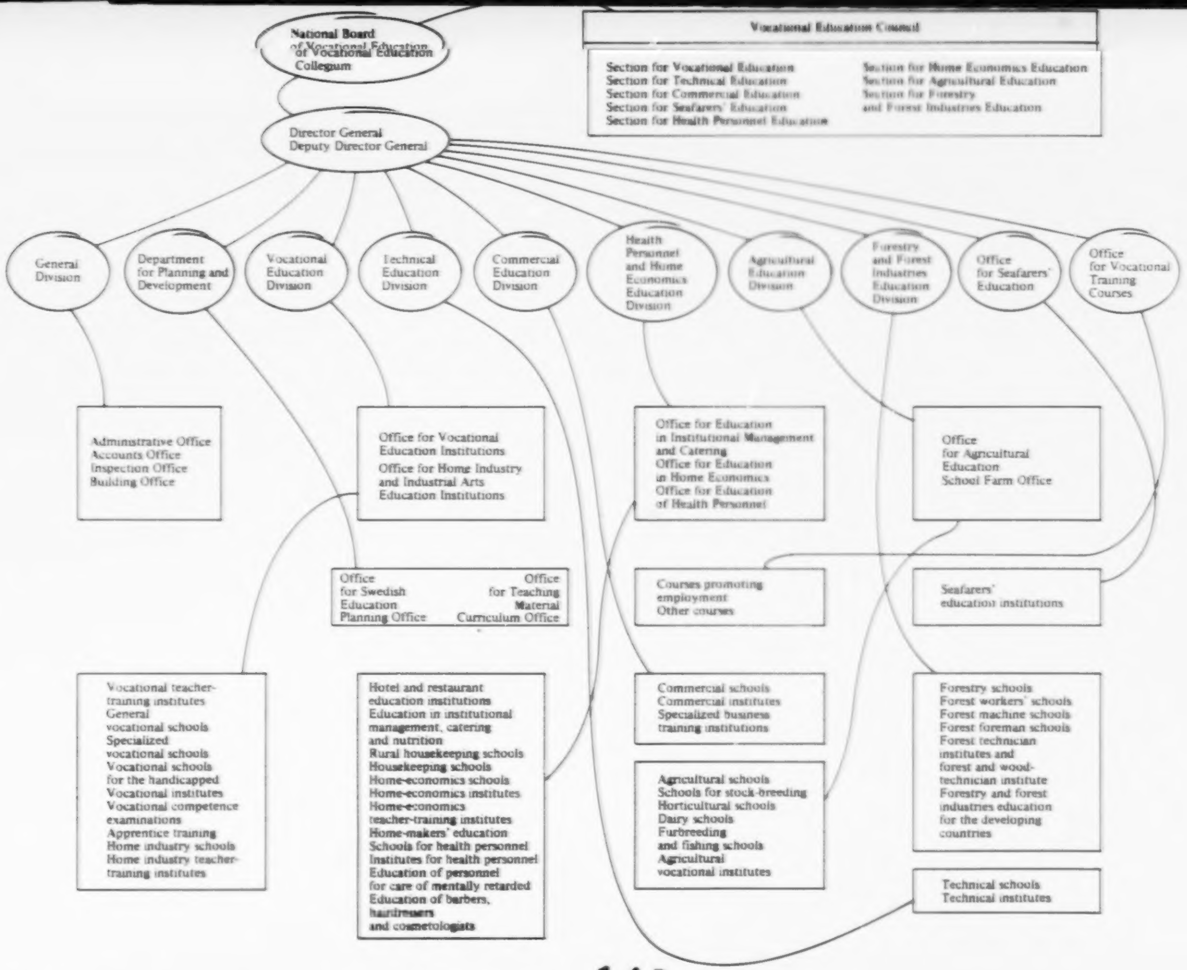

National Board
of Vocational Education
Collegium
Vocational Education Council
Section for Vocational Education
Section for Technical Education
Section for Commercial Education
Section for Seafarers' Education
Section for Health Personnel Education
Section for Home Economics Education
Section for Agricultural Education
Section for Forestry
and Forest Industries Education
Director General
Deputy Director General
General Division
Department for Planning and Development
Vocational Education Division
Technical Education Division
Commercial Education Division
Health Personnel and Home Economics Education Division
Agricultural Education Division
Forestry and Forest Industries Education Division
Office for Seafarers' Education
Office for Vocational Training Courses
Administrative Office
Accounts Office
Inspection Office
Building Office
Office for Vocational Education Institutions
Office for Home Industry and Industrial Arts Education Institutions
Office for Education in Institutional Management and Catering
Office for Education in Home Economics
Office for Education of Health Personnel
Office for Agricultural Education
School Farm Office
Office for Swedish Education Planning Office
Office for Teaching Material Curriculum Office
Courses promoting employment
Other courses
Seafarers' education institutions
Vocational teacher-training institutes
General vocational schools
Specialized vocational schools
Vocational schools for the handicapped
Vocational institutes
Vocational competence examinations
Apprentice training
Home industry schools
Home industry teacher-training institutes
Hotel and restaurant education institutions
Education in institutional management, catering and nutrition
Rural housekeeping schools
Housekeeping schools
Home-economics schools
Home-economics institutes
Home-economics teacher-training institutes
Home-makers' education
Schools for health personnel
Institutes for health personnel
Education of personnel for care of mentally retarded
Education of barbers, hairdressers and cosmetologists
Commercial schools
Commercial institutes
Specialized business training institutions
Agricultural schools
Schools for stock-breeding
Horticultural schools
Dairy schools
Furbreeding and fishing schools
Agricultural vocational institutes
Forestry schools
Forest workers' schools
Forest machine schools
Forest foreman schools
Forest technician institutes and forest and wood-technician institute
Forestry and forest industries education for the developing countries
Technical schools
Technical institutes

FIG. 6. Organizational chart of the National Board of Vocational Education.

7. Instruction in vocational institutions and those for higher education should be so developed that regardless of whether students advance through general educational or vocational channels, they have the chance to obtain a degree from institutions of higher learning at more or less the same age.
8. A separate definition must be made as to how students become eligible for continued study towards degrees in other fields than those for which their earlier studies have made them eligible.

The objectives presented above are being approached through partial reforms, the first of which concern development of the curricula of vocational institutions.

Changes and prospects

The most significant change that has occurred lies in the above-mentioned 1974 decision, and its influence on the educational system. In 1978, an act was passed on the development of secondary education. The reforms required by this act will have been carried out by 1988.

According to paragraph 2 of the act, secondary education will be developed in accordance with the principle of an integrated school system as stipulated in the act. The general aim of the instruction in upper secondary schools and vocational institutions is to provide students with the capabilities necessary for a manifold development of their personality, from the point of view of society and the job market, to offer occupational guidance and continued or further studies, and to promote the national culture, international co-operation and equality between the sexes.

The upper secondary school is being developed as a three-year system providing general education and universal eligibility for higher education, in such a way that its first year will form a useful entity and one as nearly complete as possible.

The objectives in the development of vocational education are:

1. The qualitative reform of vocational education in such a way that it will meet the demands for acquiring, maintaining and expanding the vocational skills required by different fields within the job market both as they are at present and as as they develop.
2. The planning of openings in vocational institutions so that all who have completed comprehensive school or upper secondary school will have the chance to enter specialized vocational education; in addition, a certain percentage of those who have completed the first vocational level of training will have a chance to enter the following level of specialized vocational education.
3. The distribution of the total number of openings in vocational insti-

tutions among different fields of training and different levels in accordance with the training needs of the society and the requirements of the job market as it develops.

4. An improvement in possibilities for further studies by arranging vocational studies based on the comprehensive school as an alternative channel leading to institute level and from there to higher education; and by developing instruction so that it meets the requirements that will produce eligibility for further studies.

Major issues

Economic needs

Every effort is made to identify openings in vocational education on the basis of projections made primarily for the development of various sectors of the economy and for vocations within these sectors.

The following main requirements have been established for making a projection of the demand for a labour force by economic sectors: as rapid a growth as feasible in production is assumed, as well as permanent external stability in the 1980s; industry is emphasized, so that its supply of labour is assured even under circumstances of significant international economic growth when the demand is great. At the same time, due care is taken that mutual relations between economic sectors are such that the economy as a whole will function in its other sectors with a minimum of disturbance in the case of a rate of growth faster than expected. In addition, the growth of the public sector is assumed as remaining roughly within the present frame during the 1980s.

Based on these assumptions, an average growth of 3 per cent in production is projected for the period between 1976 and 1990. When the estimated growth of 1.5 per cent between 1976–1980 is taken into account, then the annual growth in production should be more than 3.5 per cent in the 1980s.

The production estimate prepared by the relevant committee foresees that the share of industrial production in total production will, at 1975 prices, grow about 2 per cent slower between 1976 and 1990 than during the preceding fifteen-year period. Growth in industrial production will take place only during the 1980s. Services will increase their share in the 1970s, from which level they will decline 0.5 per cent by the year 1990. The relative shares of primary production and construction will decline by more or less equal amounts, i.e. 3.5 per cent, during the period 1976–90. The percentage distribution of employment by economic sectors, derived from the production estimates of the committee, is given in Table 1. The level of employment in the committee's estimate will be 2,131,000 man-years in 1990. It follows from the training target for the entire

TABLE 1. Estimated percentage distribution of employment

Sector	1960	1975	1980	1985	1990
Primary production	31.1	14.1	11.6	9.9	8.7
Industry	23.5	27.8	27.1	27.6	28.0
Construction	10.3	10.4	9.4	8.6	7.8
Services	35.5	47.7	51.9	53.9	55.5

relevant age-group that the demand for labour is to be considered at the full-employment level. Following the committee's estimate, employment was raised to the full-employment level by making a proportionate adjustment in the level. It was estimated that 2,208,000 man-years in 1990 would represent full employment.

When preparing a development assessment for the vocational structure of the labour force, both foreign studies and an assessment of possible development prospects in Finland up to 1990, made on the basis of development trends during 1960–75, were investigated.

Social aspects

The main principles guiding the development of secondary education, discussed above, also include the social aspects of education. An opening is reserved for nearly every person in the relevant age-group to continue education at secondary level, either in the upper secondary school or in a vocational institution. Those students who, on completion of the comprehensive school, have for some reason not gone on to the upper secondary school or a vocational institution and have not found jobs, have the possibility in some parts of the country of continuing in the comprehensive school in the so-called tenth grade.

Youth unemployment. The increase in unemployment among the young has attracted considerable attention in recent years. Various means for reducing it have been sought through vocational education. In addition to the simple expansion of vocational education, the basic study lines have been extended, apprenticeship training has been expanded, and interim vocational education has been continued.

Drop-outs. In 1977, 5,972 pupils dropped out of vocational institutions. This was 4.5 per cent of the total student body. See Table 2.

In 69 out of 100 cases, the pupil dropped out of the vocational institution during the first year of study.

The drop-out rate for the upper secondary school is higher, 8.5 per cent. Again, the majority of the drop-outs leave during or on completion of the first year.

TABLE 2. Drop-outs from vocational institutions in 1977

Reason for dropping out	%
Transfer to other training	19.8
Transfer to the job market	16.0
Move abroad	1.0
Illness, disability	5.9
Death	0.7
Expulsion	3.4
Unknown	53.2

Those who have dropped out of secondary education have the possibility of continuing later on either in the same institution or, by following normal application procedures, in some other educational institution.

Apprenticeship training. Through apprenticeship, those who have reached the age of 15 have an opportunity to obtain the required training for a vocation while acquiring practical skill and the necessary qualifications for that vocation. Apprenticeship training primarily takes the form of guided instruction at the work site, during the normal operations of the business or industry. In this way, the apprentice has a chance to take part in, and become familiar with, actual working situations. During this period, the apprentice is paid a salary in accordance with the terms of his contract. The theoretical instruction that belongs to the apprenticeship is given in either vocational institutions or in a vocational course centre. Each study-year includes a theory course, which varies from two to nine weeks. This course is free for the student. In addition, he receives a per diem during the course, and a family allowance when necessary.

For the planning and administration of the apprenticeship training programme, the Ministry of Education has set up central committees in twenty-six different vocational fields to assist the state Board of Vocational Education, with representatives from the labour market organizations, the state Board of Vocational Education, and the vocational institutions. The most important function of these committees has been the preparation of the curricula used in the apprenticeship training programme and organization of the qualifying examinations.

About half the apprentices in the programme are under 20. About half have also completed basic vocational education.

For those who have completed the comprehensive school, there are the following other ways to obtain a general or civic education or a vocational education: Non-formal high schools, which are boarding schools.

Open academies, which are also boarding schools.

Civic and workers' institutes, part of which are for adult education.

Sports institutes, boarding schools.

Hobby and handicraft teachers institutes.
Various youth clubs.
Evening upper secondary school.
Correspondence schools.

Vocational course centres. Courses for adults in Finland for the purpose of refresher, continuing, or retraining have been arranged since the 1950s, primarily as part of labour-force policies. On the basis of the experiences gained, the present system of adult vocational education was developed. Decisive to the functional development of this organization was the 1970 amendment to the relevant law, which made possible the founding of vocational course centres. Along with the creation of the educational organization, both curricula and teaching methods suited for adults were also developed.

Disadvantaged groups. Vocational education is provided for minority groups, especially Lapps (about 4,000), gipsies (3,000), and refugees (100).

Finnish Lapland, which includes four municipalities in Northern Lapland, differs from the rest of the country in many respects. The area's extent, environment, sparse population, language situation, local culture, and meagre economic resources all call for special arrangements.

In 1978 a law was passed concerning vocational education in Finnish Lapland. According to this law, the primary purpose of a training centre is to provide vocational education in line with the needs of local business and industry, taking into account the traditional means of earning a living and the development and preservation of the local economy and the traditional local culture. The teaching languages used are Finnish and Lapp. Education may take place in the formal school system and in special courses, as well as in extension education, primarily in the fields of the traditional trades, handicrafts, construction, metalwork, and all fields relating to the traditional culture of the Lapps.

The educational level of gipsies as a group in Finland has been exceptionally low. For this reason, it was necessary to take special measures. Gipsies have taken part in the vocational education arranged in vocational training centres since their establishment in 1970. The first educational courses arranged especially for gipsies were given in 1970 and 1973. In 1979 more systematic training for gipsies was given in the fields of sewing, horsemanship, and music. A commercial course is in the planning stage.

The starting point for instruction is the gipsies' own culture; and instruction takes note of their traditions, history, language, and customs. The courses are intended primarily for those who have not benefited from the regular services provided by the labour force authorities for vocational training and/or entering a working life. During the course, a realistic employment plan is worked out for each student, according to his expectations and qualifications, taking into account the needs of both the individual and the society.

Democratization

The comprehensive school provides equal opportunities for both boys and girls to realize their vocational-education goals. The knowledge and attitudes they acquire and the vocational guidance they receive in the comprehensive school influence their choice of a vocation. On the other hand, the development of equality of the sexes in vocational education also depends on the labour market and its division into traditional mens' and womens' jobs.

There have been obstacles to the realization of complete equality between the sexes in modern vocational education. To be sure, the training itself is, in principle, the same for all in its contents and objectives; neither has there been any division according to sex in the training given for the same field.

Nevertheless, there have been features in the structure of vocational education that have maintained sexual inequality. The students themselves have chosen their area and level of schooling according to their sex. Girls have applied for vocational education less often than boys, and those girls who do apply do so in a far narrower range of vocations and generally for a shorter period of training.

The current reform of secondary education will probably contribute to creating the necessary conditions for achieving equality between the sexes by unifying the general education content of various fields and by equalizing to some extent the duration of schooling in various areas.

It should be noted that the law on the development of secondary education regards the promotion of equality between the sexes as one of the general objectives of secondary education.

Integration at the first stage of the secondary level

As noted at the outset of this study, primary education, which is compulsory in Finland, begins in the calendar year during which the child turns seven. The compulsory, comprehensive school lasts nine years, divided into a six-year lower level and a three-year upper level. This means that the education of the age-groups from 12 to 15 years takes place in the upper level of the comprehensive school.

According to the law regulating the comprehensive school, the national school system must be developed in accordance with the principle of an integrated school. This requires that comprehensive school education shall be more or less on the same level, of the same content, and available to everyone, irrespective of their place of residence. In order to allow for individual differences between pupils, educational content must be diversified, but should still as far as possible remain basically the same for an entire age-group. In basic subjects such as mother tongue, mathematics and foreign languages, which are central from the point of view of a pupil's further studies, special attention is paid to ensuring that the entire age-group reaches a certain minimum level.

According to the procedure now in use, a so-called organizational differentiation is applied to the instruction of mathematics and the two compulsory foreign languages. This means that the material to be taught in these subjects is grouped at each grade-level into two or three courses with differing requirement levels. The parents of a pupil select the level-course the pupil will follow, on the basis of recommendations made by the school.

Organizational differentiation at the upper level influences a pupil's further studies in that entrance to the upper secondary school or institute-level vocational education requires the completion of at least the medium-level course in subjects that have three alternative levels (mathematics and the first foreign language), and the completion of the broader course in the second foreign language, which begins at the 7th-grade level of the comprehensive school. (A pupil's first foreign language is always one of Finland's two official languages which is not the pupil's mother tongue.) The second foreign language has only two course levels.

Attempts are being made to eliminate the present differentiation procedure in the comprehensive school. Instead of the current organizational differentiation, differentiation within the study group is to be desired. The purpose is to achieve such a system in the 1980s that all pupils who have completed the comprehensive school will be eligible for the upper secondary school and for all vocational institutions based on the comprehensive school.

Curricula

The curriculum in grade-levels 1 to 7 has the same content for all pupils. From the 7th to the 9th grades, in addition to the compulsory subjects (26 hours a week), a pupil is allowed to choose 4 hours a week of elective subjects. The electives are: technical work, textile work, home economics, agriculture and forestry as well as horticulture, business and commercial subjects, typing, and a third foreign language.

Under the regulations, girls and boys may be taught separately in handicrafts and in physical education from the 3rd grade onwards. In the curricula of other subjects, no differences are made according to sex.

A list of subjects taught in the comprehensive school and their hourly distribution is given in Table 3.

TABLE 3. Subjects taught in the comprehensive school and their hourly distribution in the five-day school week

	Grade								
	1st	2nd	3rd	4th	5th	6th	7th	8th	9th
Required subjects	2	2	2	2	1	1	1	1	1
Nature studies	3	2	1	1	—	—	—	—	—
Mother-tongue	8	8	5	5	5	5	3	3	3
1st foreign language	—	—	2	2	2	2	2	3	3
2nd foreign language	—	—	—	—	—	—	3	3	3
History, social studies	—	—	—	—	2	2	2	2	2
Civics	—	—	—	—	1	1	1	1	—
Mathematics	3	4	3	3	4	4	3	3	4
Physics, chemistry	—	—	—	—	—	—	2	2	3
Natural history, geography	—	—	3	3	3	3	2	2	3
Physical education	–3	–3	3	3	3	3	2	2	2
Music			–3	–3	–3	3	1	1	–1
Arts	1	1					1	2	
Handicrafts	1	1	2	2	2	2	3	—	—
Home economics	—	—	—	—	—	—	3	—	—
Vocational guidance	—	—	1	1	—	—	1	1	1
Total number of hours/week	19–21	19–21	23–25	23–25	24–26	24–26	30	26	26
Elective subjects									
The curricula must include									
technical work							—	2/4	2/4
textile work							—	2/4	2/4
home economics							—	2	2
agriculture and forestry							—	2	2
commercial subjects							—	2	2
typing							—	2	2
The curricula may include									
special courses for those pupils whose mother-tongue is Lapp							—	2	2
English, French, German, or Russian for pupils in the lower level who intend to study these languages in depth at the upper level							—	2	2
Latin on the approval of the Council of State									
Pupils' number of hours							30	30	30

Pictorial arts and music are an elective at the 9th grade level

The starting point when setting educational objectives in the comprehensive school is that the school's primary task is to offer the material and stimuli necessary for the development of an individual, balanced personality. This overall objective is divided in the curriculum into the following segments: acknowledgement of the role of human biology in education; objectives for information and knowledge imparted by education; ethical and social objectives of education; objectives for education in religion, aesthetics; the development of manual and practical skills; and objectives in the integration of a personality and the promotion of mental health.

Instruction in handicrafts

The basic aims of instruction in handicrafts are delineated as part of the overall aims of the comprehensive school. They are:

1. Instruction in handicrafts should give the pupil the ability to use different materials, working methods, and tools, and to keep up with developments in the field.
2. Instruction in handicrafts should take into account familiarization with meaningful work, from the point of view of both the individual and society. This is accomplished by familiarization with conscientious, durable work and by paying attention to work safety.
3. The development of independent, well-planned working skills plays a central role in handicraft instruction. Thus, one objective is creative work at various levels.
4. Handicraft instruction is also important in guidance for selection. This includes: the development of the attitudes of a selective consumer; education in economics (e.g. budgets); taking note of aesthetic and environmental factors in making selections; and the development of a critical attitude in all activities.
5. For the development of good mental health and the whole personality, it is important that instruction in handicrafts should give the student an opportunity to experiment with as many different hobbies as possible.
6. Instruction in handicrafts also tries to preserve and promote those crafts that belong to traditional Finnish culture.
7. Instruction in technical and textile handicrafts should also serve as a foundation for continuing education and/or vocational training in those fields. This will ensure that the student has an opportunity to familiarize himself with the various areas in technical and textile handicrafts, and will also provide him with the basics of safe use of modern appliances and mechanical aids.

Instruction in technical work in the upper level of the comprehensive school should be so designed that it promotes a serious attitude towards work. Instruction must emphasize the qualities appreciated in the job market, such as good planning, perseverance, and attention to detail. An essential part is training in work safety, in terms of both proper attitudes and knowledge. Another important element in this instruction in the upper level is the provision of the basic knowledge necessary for the selection of a vocation and continued studies. Instruction must take equally into consideration the areas which are important from the points of view of the individual, business and industry, technology, and the whole Finnish economy.

To provide pupils with enough information on which to base their future vocational training choices, visits to factories and other methods for becoming familiar with business and industry should be planned by the technical teacher together with the vocational counsellor.

Instruction in the upper level is divided into three areas: woodworking, metalwork and study of machines and electricity. Each area should have an equal share of the total number of hours.

Every effort is made in the instruction to move away from a mechanical, repetitive mode of student performance towards creative thinking and production, in which the pupils take as active a part as possible in the planning. By learning different skills, by experimentation, and by practicing, pupils are encouraged to discover for themselves the most functional design possible for a product and its manufacture. In practice this means that, where possible, the teacher does not give the pupils an exacting model or drawing to copy but rather a topic for problem-solving and learning of work modes, setting limits on materials and work areas. Thereafter the pupil should be left alone to design his work as independently as possible.

Instruction in wood-work also includes practice in the use of woodworking machines, the use of wood in industry and construction, and work with plastics.

In metalwork the pupil learns heat treatment and other techniques.

In the study of machines and electricity, the pupil learns about the different types of combustion engines, electric motors, pneumatics, hydraulics, and other important areas of production.

Additionally, the syllabus includes short periods reserved for hobbies.

Methods and materials

The emphasis in technical instruction must be on practice. In the context of technical phenomena and theory, instruction must be integrated with the natural sciences. If the fundamentals of certain subareas have not already been taught in connection with the natural sciences, they must be explained in broad outline within the context of technical instruction.

Teaching materials for this level in technical instruction are not yet available. A pupil's manual is in the planning stage. After it is issued, alternative assignments, which will lead the pupil to creative design and technical innovation, will be added.

Physical facilities

Buildings, dimensioning of space, and furnishings required by the comprehensive school are standardized throughout Finland. The local au-

Table 4. Special rooms that can be built in schools

Type of classroom	Floor space (m^2)
Physics and chemistry	72–80
Commercial subjects	54–60
Textile work	72–80
Technical subjects, inc. storage space	36–260 scale acc. to National Board of Gen. Ed. guidelines
Farm economics	54–60
Home economics	70–140

thority, the municipality, both builds and maintains the comprehensive schools, but the state aids in their construction. The state has therefore established certain conditions for its aid, concerning quality, price level, and dimensions.

Each year the Council of State sets forth its decisions regarding the size and other dimensions and standards for the construction of comprehensive schoolbuildings. The decisions stipulate what kind of class and other rooms are considered appropriate in schools of differing size, how large the different types of space must be, and the cost per square metre that will be considered as a basis for a state grant.

According to the decision now in force, Table 4 lists the special rooms which can be built for each school in addition to normal classrooms. The National Board of General Education issues instructions for furnishings for the different types of classrooms.

Differences between rural and urban areas

The syllabus is the same for the entire country, but regional environmental and cultural factors should be taken into consideration when planning the instruction. It is common in rural areas to find that pupils are more apt to choose agriculture, forestry, and horticulture as an elective subject. In urban areas, it is difficult to find the minimum number (12) of students required for this subject. Urban pupils usually choose the study of machines and electricity (electronics).

Teachers

Teacher training today takes place within the frame of integrated training. Technical work is taught at the upper level by subject teachers whose level of education is similar to that of other subject matter teachers. One can become a technical subject matter teacher by going through a university-level training institution (upper secondary school diploma plus four years). Present teacher training is open to both men and women; in practice, about 20 per cent of the graduating teacher candidates in technical studies are women.

The four-year training programme for technical teachers has been in existence for seven years. Four-year training for textile and home economics teachers began in 1979. For the moment, all of the teachers in these last two fields are women.

At present, about 33 per cent of the technical teachers employed have received the training of a 'cottage industry' teacher, gaining eligibility after a short pedagogical course. About 33 per cent are classroom teachers in the lower level of the comprehensive school who have completed some form of higher education (continued studies). About 33 per cent are those who have completed the new, university-level training programme. In about fifteen years, all technical-work teachers will have received university-level training.

In the lower level of the comprehensive school, every classroom teacher has a qualification as either a technical or a textile teacher. They may also have completed a course of specialization (600 hours) in handicrafts, following which half their timetable may consist of teaching handicrafts. The training programme begun in 1979 allows technical, textile, and home-economics teachers in the upper level to become qualified in two subjects. Technical teachers may also qualify in physics, physical education, or the pictoral arts, according to their choice. Physics will probably be the most common choice as a second subject in the future. Textile teachers may choose mathematics as an additional subject; home-economics teachers may choose chemistry.

The employer is responsible for seeing that teachers maintain their level of professional competence. In practice, this means that teachers have five days of obligatory in-service training per year, outside working hours. In addition, teacher-training institutes and summer universities organize refresher courses for teachers, either during the holiday season or during the school year. Teachers receive their salary for those days during the school year which they spend in training.

There are two types of refresher courses: the training days included in the teacher's contract (five days a year) and the voluntary courses arranged in the summer universities. The latter are planned according to regional needs, but because they are supported by the (National) Board of General Education, the officers of the Board can influence the content of the courses. These courses have usually been aimed at bringing subject-matter teachers up to date on new developments in their specializations, either as to pedagogy or content.

The aim of the five training days is to improve teachers' skills in coping with an ever-changing school system. Their content has been mainly general pedagogy.

The retraining of teachers has not, for the present, been pursued. It may be considered in the 1980s, owing to the decline in numbers of school-age children.

At present, differences exist in the level of education of teachers employed, but these will disappear in the future.

Guidance

Vocational guidance and instruction in the comprehensive school are concentrated primarily on the subject of student counselling. This subject is divided into three subareas: school-work counselling, job counselling and free-time counselling.

The aim of job counselling is to provide as realistic and concrete a picture as possible of business and industry and the job market, as well as to guide the pupil in the beginning of his own training and vocational career.

In the lower level of the comprehensive school, this guidance is provided by each classroom teacher; in the upper level, there are teachers specialized in the subject. The situation is still open in the upper secondary school. Student counselling has been tried in the upper secondary school for three years and will continue along with other innovations in the upper secondary school during the years 1979–82. Regular, permanent posts for student counsellors in the upper secondary school will be generally set up only after 1982. At present, a 'vocational liaison' teacher, who is simultaneously a traditional subject-matter teacher, carries out vocational counselling in the upper secondary school.

In the upper level of the comprehensive school, vocational guidance is treated both generally, as in the presentation of various groups of vocations, and individually, with the aim of helping a pupil in his choice of a vocation. To this end, the school may call on outside experts, for example, representatives of various occupations or vocational-guidance specialists. The classes may also make field trips to various work sites. The final decision regarding the choice of a vocation, however, remains with the pupil and his or her guardian.

After having completed the upper level of the comprehensive school, a pupil has three choices: the upper secondary school, a vocational institute or moving directly to the job market. The decision is made according to aptitudes and previous school performance. In the last few years almost half of each age-group has applied for the upper secondary school. A decision has been made to retain the size of the upper secondary school at its present level. The future decline in numbers in the relevant age-groups will be offset in the upper secondary school by a proportionate increase in the percentage of each age-group that will choose this path of continuing education.

Vocational guidance in the comprehensive school directs the flow of pupils toward secondary education which will eventually convert them into a labour-force flow. In order to take account of labour policy aspects and to prevent the emergence of various difficulties at the stage of entry into the job market, it is important that a pupil's vocational guidance in both the comprehensive school and in secondary education should take place in co-operation with employment authorities.

Vocational guidance liaison teachers

The vocational guidance liaison teacher system acts as a link between the employment authorities and the school. With the help of this system, it has been possible to extend vocational guidance services to the whole age group (12–15), in spite of meagre resources. The liaison teacher system has proved an important channel leading from the schools to the outside, surrounding society.

Comprehensive school. In the comprehensive school, a study-leader acts as the liaison teacher; in the upper secondary school, one of the teachers is selected for this job, which he takes on in addition to his own regular duties. A study-leader in the comprehensive school can also act as a liaison teacher in the upper secondary school. A similar liaison teacher network is gradually being set up for secondary-level vocational institutions as well. Hence, 'vocational education liaison teacher' will hereafter be used irrespective of whether he or she is a study-leader or an ad hoc liaison teacher.

One hour a week is available for pupil counselling during vocational guidance at both the 8th and 9th grades. The classes aim at increasing the self-knowledge of pupils and help them to identify their personal objectives and develop their skills, to acquire information and to provide as truthful and as many-sided a picture as possible as to their possibilities for further studies and entrance into the job market. The objective is to ensure that each pupil is able to devise as practical a plan of action as possible. The co-selection of secondary education institutions has both activated pupils to make plans and helped them to check their feasibility. On the basis of information obtained in the 8th grade, pupils make plans at the beginning of the 9th grade for their lives after they have completed comprehensive school. These preliminary plans can then be used as a starting point in instruction as well as in personal guidance.

The personal guidance of pupils is an important part of the liaison teacher's job. Pupils may come individually or in small groups to discuss with the liaison teacher problems related to the selection of a vocation or further studies.

The liaison teacher's job is also to create contacts with the pupil's parents and to organize information sessions for them on questions related to the selection of a vocation; to collaborate with other staff in the school responsible for the care of pupils (school health nurses, school doctors, school psychologists, school counsellors), and to maintain liaison with the vocational-guidance section of the employment office.

The comprehensive school's study-leader's job includes, in addition to the duties of liaison teacher, helping pupils in the selection of course levels and subjects, and helping them in problems of studies and adaptation by providing information and personal counselling. They also maintain a liaison with external organizations offering social and medical expertise that provides support for pupil guidance (e.g., the Mental Health Office, Child Guidance Clinic, etc.). The study-leader is in one sense a co-ordinator who has the overall responsibility for a pupil's guidance.

Upper secondary school. In the upper secondary school, one of the school's regular teachers acts as the vocational liaison teacher. The comprehensive school study-leader can also perform this function. The liaison teacher organizes classes and information meetings for pupils on questions related to studies and the selection of a vocation. Pupils can also go to him/her to discuss their personal problems related to studies and the selection of a vocation.

Other secondary-education institutions. In the new secondary-education school system, pupils completing comprehensive school choose the field in which they wish to study and enter the basic general programme of that course. After the one-year general period they then choose their own line of specialization, which may lead either to a vocation or to further, institute-level studies.

The changes in the system of secondary education also influence pupil guidance. The new system is easier to outline than the present one. The selection of a specialization has been moved slightly forward in time and can take place on the basis of a pupil's own impressions gained from a given field. This also implies that the need for pupil guidance will increase in secondary schools. Pupils need guidance in adopting study methods that deviate from those of the comprehensive school during the general period; and they need guidance in the selection of a line of specialization during the following period. Upon completion of secondary education they need guidance when they transfer from a trained vocation to the job market or when they select further studies.

The consultations and work-guidance provided by occupational counsellors to liaison-teachers are a continuous process of complementary education. In confidential discussions, all the problems that occur in the work of the liaison teacher may be brought up: objectives, contents and methods of education, pupil's personal guidance, problems of the individual pupil, etc. Counsellors and liaison teachers in a given area may also hold regular meetings as a group in which future activities are planned and current problems discussed. In this way actual in-service-training events may deal with broader topics that clarify underlying theories and open new vistas.

Occupational counsellors almost always participate in the information meetings organized by liaison teachers for parents. For them, these are the only occasions for contact with pupils' parents, whose influence on their children's choice of a vocation is considerable.

Employment authorities supply liaison-teachers and pupils with national and local information and educational materials. There is also a textbook available for instruction in the selection of a vocation and designed for use in the comprehensive school. The teaching materials supplied by the employment authorities are intended primarily for the provision of stimuli and background for the teacher to use in planning classes. Information and facts on vocational guidance are used in instruction as reference reading and source material: pupils are taught how to look for and find information. Familiarization with the job market cannot take place solely through the aid of written material. There is also a need for information acquired through personal experience. This can be accomplished by field trips (to mills, factories, etc.) and by periods set aside for familiarization.

Reforms

The most important rulings and Committee Reports relating to the reform of general education are:

1968 Act on the fundamental principles governing the school system.
1970 Decree on the comprehensive school.
1970 State Committee Report on the comprehensive school syllabus.
1975 Interim Report of the Syllabus Committee (revised outline of syllabus for entire school system).
1977 Committee Reports 1 and 2 on the syllabus for the upper secondary school.
1978 Act on the development of secondary education.
1979 Report of the committee on innovations in secondary education (various experimental schools, etc.).

Selection

Collective application

Almost without exception, entry to all institutions of secondary education in Finland after completion of the comprehensive school involves a collective application. This means that the applicant fills in only one form, by which he can apply to all the institutions of secondary education he wishes. At the time of application, no certificates, grade records, or other documents need be presented. The application form may be used to apply for a place in any institution in any province, regardless of the applicant's province of residence.

The following educational institutions come within the sphere of the collective application: general vocational schools; the upper secondary school, excluding evening school; commercial educational institutions, excluding university level; agricultural institutions; forestry schools; cottage-industry schools; home-economics institutions; hotel and restaurant (catering) schools; seamen's schools; nurses' schools; non-formal schools and some non-formal high schools.

The collective application described above does not include technical educational institutions, which have their own national selection board. In the same way, most of the other institute-level lines of continuing education and employment promotion training fall outside the collective application.

Admissions policies

In approving admissions policies, every effort is made to take into consideration on the one hand general training-policy requirements and, on the other, the requirements that are derived from vocational training. General regulations primarily concern the realization of educational equality. Regulations set by vocational training stress those factors in the selection of pupils that are linked to vocational studies.

Realization of equality is interpreted in such a way that entrance to training must be guaranteed for all basic-training groups (comprehensive and upper secondary schools) and that those persons belonging to older age-groups who were previously left without a training place also have the possibility to enter training.

The basic training of applicants is taken into account when selecting for admission, in that admissions are based on quotas given for each basic-training group. The number of applicants selected from each group must be in the same proportion as the number in this group is to the total number of applicants. (If 40 per cent of all applicants have completed the comprehensive school, then 40 per cent of all persons selected for training must come from the comprehensive school group.) Older age groups are favoured by additional points given on the basis of age. In certain fields such as commerce, agriculture, nursing, and the hotel and restaurant field, extra points are given for work experience.

The applicant is given points for his interest. This has been justified on the basis of the importance of motivation to successful studies. The

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applicant receives 5 points for his first-priority institutions, 3 points for the second priority, and one point for third-priority institutions.

The applicant's general aptitude for learning is measured by his previous school performance in mathematics and his mother tongue, as shown in the grades on his school certificate.

The special requirements for admissions to each separate field are measured by three grades for various fields in the certificate. If one of the requirements is work experience, only two grades are taken into consideration.

The factors mentioned above and the points received for each form a total number of points: selection for admission is made in order of superiority within each basic-training group quota.

Integration at the second stage of the secondary level

One practical objective of the reform in secondary education is the simplification of the school system. One way of reaching this goal is by integrating syllabuses and defining common study contents.

Vocational education will be divided into 24 basic lines, which will together contain over 200 lines of specialization on the school or institute level. The basic lines all begin with a one-year general period, on the basis of which training is diversified into periods of specialization at the school and institute levels.

Including the general period, the duration of training varies from two to three years at the school level and three to five years at the institute level.

The student advances from one training period to another primarily as follows: from the general period through the school-level certificate to the job market, or through the institute-level certificate (degree) to the job market or on to higher education. If the student wishes to change basic lines or transfer between the upper secondary school and vocational channels, he must return to the beginning of the general period, due to the different study content of each vocation. When a student applies to an institute from school or from the job market, and by this route possibly continues on to higher education, he must start at the beginning of the institute level.

In these cases, the student will receive credit for contents common to both lines already studied. The total time required for his studies is not likely to be shortened decisively, however. The time thus freed is used for optional subjects or for further studies within the limits of the study programme offered by the institution. Possibilities for easing the transfer

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from one training line to another can be defined only after comparison is made possible by the completion of the total, overall syllabus.

Vocational diversification begins upon completion of the general period. The study requirements should now be prepared so that the requirements of the various institute-level and school-level basic lines are comparable and as structurally unified as possible. All study requirements are unified by the basic facts and skills usually demanded of members of society, and by the study content related to the development of personality.

Selection for institute-level and school-level studies must be based on demonstrated skills in vocational subjects and theoretical subjects important for the vocation in question, as well as in the studies leading to the latter. The contents of general education should not, however, form an obstacle to the completion of a trained vocation.

For those who have completed the institute-level degree in full or at least in those parts that are required, a certain number of places are reserved in the field of higher education. Vocational education in theoretical subjects must also offer a sufficient basis for higher education in the given field. The student passing through vocational-educational channels must be able both to carry out studies in higher education successfully and to complete a degree in higher education at more or less the same age as the student who has advanced through the general education channel.

The opening of a competitive channel for continued studies requires in any event the closer integration of studies in higher education with those at the vocational institute level, so that the vocational channel will become by virtue of its contents a natural, continuous path to degrees in higher education. This also presumes a change in the emphasis of the selection procedure from the present formal grounds to performance-based skills demonstrated in common tests. When measuring study results, stress should also be put on an end level of preparedness common to all secondary-education studies. Evaluation must be so directed that it takes into account all of the instruction given at the institute level, and not just the instruction in general education subjects contained in the syllabus.

Curricula

The general component of the curriculum of vocational education will vary according to the vocations concerned. A component of related theory is likewise included in each specialization. Integration of general education content at the vocational-institute level with that of the upper secondary school, which deals with all studies in higher education, is not feasible beyond the unification of minimum core content.

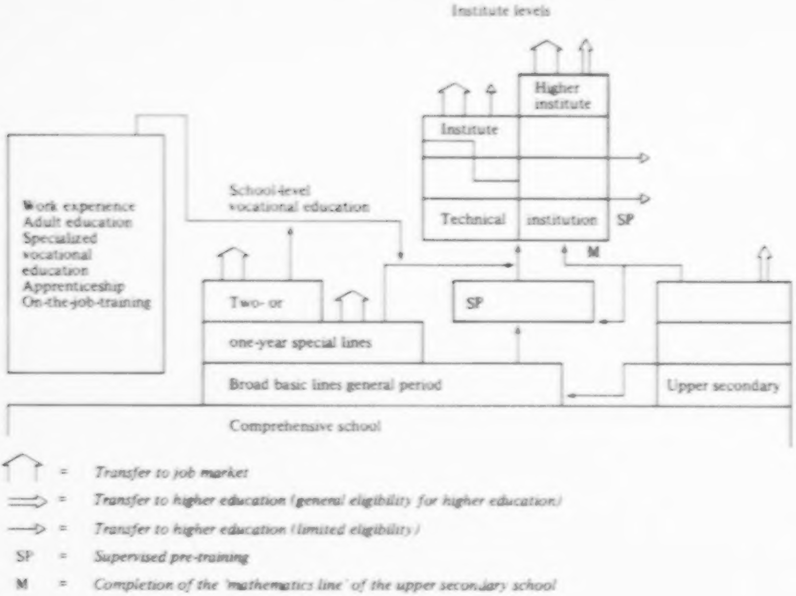

Institute levels
Higher institute
Institute
Technical institution
SP
M
School-level vocational education
Work experience
Adult education
Specialized vocational education
Apprenticeship
On-the-job-training
Two- or
one-year special lines
SP
Broad basic lines general period
Upper secondary
Comprehensive school
= Transfer to job market
= Transfer to higher education (general eligibility for higher education)
= Transfer to higher education (limited eligibility)
SP = Supervised pre-training
M = Completion of the 'mathematics line' of the upper secondary school

FIG. 7. Outline of the structure of technical vocational education.

Work-study programmes

The degree requirements in vocational education often include, in addition to study in the classroom, instruction at a work site. The rotation of work and study takes place as part of the curriculum in the form of a practice period either within the study period or outside of regular study hours.

On the basis of the structure of the training, one may speak of practice at a work site or apprenticeship. Practice at a work site is defined as practical work carried out in a normal work environment under the supervision of the employer. This work is one of the eligibility requirements for entering institutions and meets one of the degree requirements. Institute-level vocational education in particular commonly uses the 'practice at the site' method. Practice can take place either prior to the actual study period, in the middle of studies, during vocations, or after completion of studies. Accordingly, the practice is referred to as pre- , interim, or post- practice. Duration varies from two to twenty-seven months, the longest periods usually being in technical fields. The most important practice regulations and durations are given in Table 5. The institution and the employer or the student himself are made responsible for ensuring that the work experience meets the regulations established by the school.

As the implementation of the reform in secondary education advances in the 1980s, the share of practice will, generally speaking, increase and be unified. For example, training in the technical field will include a one-year supervised work-study period placed between the broad general education period and the institute-level specialized training. Special attention will be paid to reforms in this practice period in the following areas:

Practice is included in training, therefore the responsibility for organizing practice will shift more and more from students to educational authorities.
Objectives and contents of practice will be defined in the curriculum.
The employer will supervise practice and the school will oversee it.

Employment training has strongly increased during the economic depression of the late 1970s in comparison to traditional education. The curriculum of employment training usually includes a three-to-six-month practice period in industry following the course.

Teaching methods

The following is a short survey of the teaching methods used in vocational education in Finland. The purpose is to describe in general terms the primary developments taking place in teaching methods and the main features of these developments.

All those measures in a school that aim at bringing about behaviour in accordance with the objectives of the school can be called teaching arrangements. This is a very broad concept. It may include, for example, working modes, didactic principles, and teaching materials.

Methods have always had a central role in teaching arrangements. Methods are the road by which the interaction taking place between the teacher and the student is guided to the desired goal. Of late, the term 'working mode' has been used increasingly in place of 'teaching method'.

The transfer from the term 'teaching methods' to 'working modes' also aptly illustrates the change in emphasis that has taken place in the 1970s in the methods used in Finnish vocational training. The teacher is no longer a disseminator of information standing in front of the class, nor are the pupils merely passive listeners; rather, school work is active on both sides, at its best a kind of seamless collaboration.

The orientation described above is supported by a practical approach, the possibility for the immediate application of knowledge, the concrete appearance of learning results following an assignment, etc.

The strong force behind the move that began in the early 1970s away

TABLE 5. Practice regulations related to vocational education (main features)

Vocational institutions	Practice requirements		Study (excluding practice) in years
	Duration in months	Type of practice	
Clothing industry	12	pre-	1–3
Teacher education	24	pre-	3
Home industry and industrial-arts education institutions			
School level	1, 5–4	interim	2
Institute level	4–9	interim	3
Catering			
Industrial kitchens, supervisory study line	24	pre- + post	2
Hotel and restaurant food and kitchen dept.	16	interim	1–3
Waiters and restaurant service	2.5	interim	1
Supervisory lines	14	interim	2
Home economics			
Home-economics teachers	12	pre-	3.5
Home-economics technicians	12	pre-	2
Housekeepers	10–15	interim	1–2
Managers	24	interim	1.5
Agricultural education			
Farm management	5 + 5	interim	2
Animal husbandry	12	pre-	1
Horticulture	8–24	pre-	1 and 2
Dairy industry	3–12	interim	1 and 2
Agricultural institute	5 months + summer course + special practice		2.5
4-H extension	2		
Forestry education			
Forest machine mechanics	3	interim	1
Sawmill supervisor	6	pre-	2
Forest technicians and wood technologists	12	pre- or interim	3
Forestry foreman	12	pre- or interim	2
Seafarer education			
Helmsmen	12	pre-	2
Ship's cook	12	pre-	1, 5
Technical institutions			
Technical schools (technician)	23–27	pre- + interim	3
Technical institutes	12–16	pre-	4
Institute (upper secondary school completed)	12	during studies	3
Hospital field			
In accordance with the relevant decree, instruction in nurse's training institutions covers both theoretical and practical education.			

from teacher-centred working modes (e.g. lectures) towards pupil-centred modes (e.g. guided study) led further to the development of the so-called learning systems. Hence, one does not speak so much of certain working modes and rigid adherence to them, but rather of learning systems in which several working modes may be applied during the same session. The goal is then the most efficient and trouble-free achievement of the target established for that particular situation. For example, in guided or programmed study, one can visualize extensive learning situations realized with working modes other than that of simple division into individual sub-tasks.

Factors related to developments in working modes

Development of working modes and teaching systems has aimed at raising the level of vocational training, improving the results of study, and making the work atmosphere in learning institutions a pleasant one.

Working modes are indisputably linked to the attainment of the above goals. Three factors should be mentioned here as being the background of the developments in working modes. These same factors would seem to have a decisive role to play in future developments as well. They are, namely, attitudes towards studies, the co-planning of studies, and syllabuses of vocational training.

Study attitudes. The latest research findings concerning Finnish vocational training show that positive attitudes towards study have a decisive role in the explanation of study results. Note should also be taken of this factor in developing working attitudes, so that the aim would be to develop systems that promote positive attitudes towards study.

Co-planning of studies. This feature of development in Finnish education of the 1970s is also found in vocational education. In co-planning, the students actively participate in setting their own goals and in the selection of working procedures and teaching materials to meet these goals. Thus, students become partially responsible both for implementing learning situations and for the results obtained.

Syllabuses. Trends in the development of working modes have been noticeably clarified by the reform in syllabuses that has been carried out in Finland. In this connection, there has been a systematic trend away from content-centred and toward skill-centred syllabuses.

Learning systems

Development of learning systems is based on the concept of a process approach. Schematically it may be presented as follows: (a) readiness at the start, (b) theory, (c) research and problem-solving, (d) application and (e) readiness for use. The central features of each phase are:

Readiness at the start involves a report on the level of departure, on the individual goals of students and on guidance for the adoption of positive study attitudes.

Theory concerns input data and a theoretical framework. The point of departure is not the theoretical knowledge of the subject, but an analysis of the task at hand. The path for advancement is chosen on the basis required by the process (from known to unknown, concrete to abstract, etc.).

Research (e.g. laboratory) means stating the problem, formulating hypotheses, making experimental observations, envisaging the application of results, drawing conclusions, thinking of possible future research, and drafting a report, here special attention is paid to the development of creative problem-solving ability and a technical way of thinking.

Application (e.g. performance of a work-phase) involves making efficient parallel use of practical and theoretical study, and a linkage to production.

Readiness for use means verification of the achievement of the goal (the student's own self-assessment is an important part), connecting a particular skill readiness to larger units previously learnt or forthcoming, and considering the student's whole personality, studying and learning are monitored during the whole process.

Teachers

Main features of the training

The Ministry of Education has the primary authority for the organization and supervision of teacher training, as well as for matters concerning teacher training that belong to the jurisdiction of other higher administrative bodies. The institutions of higher education arrange the basic, continued, and in-service training for teachers in the comprehensive and upper secondary schools. However, short-term in-service training that forms part of a teacher's duties is handled by the National Board of General Education and by provincial and municipal school authorities. Kindergarten-teacher training has also been organized within the institutions of higher education on a temporary basis. This is actually the job of kindergarten teacher institutes, which are subordinate to the National Board of General Education. Teachers in vocational institutions are trained in the institutions subordinate to the National Board of Vocational Education. Teacher training thus organized is, however, often preceded by a degree from an institution of higher education.

Teacher training for vocational institutions is now organized, in principle, in three ways:

1. The institutions that award teacher's degrees without a previous vocational degree: e.g. the handicrafts and cottage industries teacher-training institutes and the home-economics teacher institutes, and the vocational teacher-training institute in Jyväskyla (one of two operating in Finland).
2. The institutions that primarily give pedagogical training for those who already have a vocational qualification. These are the vocational schoolteacher institutes and the continuing education divisions of certain nurses' training institutions.
3. Practice teaching for those who have completed a vocational degree: arranged in agriculture, forestry, and commerce.

In addition to the above, teacher training is also organized in one horticulture institute and in one dairy institute. Short pedagogical in-service training courses have been arranged for teachers in technical institutions.

The decrees concerning various vocational institutions contain the regulations setting the qualifications for teachers in supervisory positions, lecturers, vocational teachers, and subject-matter teachers in these institutions. A great deal of discussion has taken place in recent years as to whether or not a separation should exist between teachers of theory and workshop teachers. Both theory and work instruction should be equally integrated in the syllabus. The trend has been away from programmes divided by subjects in the syllabuses towards the instruction of educational units by developing group work among teachers.

In terms of the organizational arrangements of teacher training, teachers can be divided into two basic groups: teachers of vocational subjects and those of general subjects. A part of the degree requirements for the former can be completed at universities or in the faculties of education in institutions of higher education. Teachers of general subjects in vocational institutions are generally those who have completed the training for subject matter teachers provided by the faculties of education.

According to the statistics (autumn 1977) vocational institutions had 7,699 permanent teachers, 2,120 full-time hourly teachers and 3,915 part-time hourly teachers, for a total of 13,734.

About 61 per cent of full-time teachers and 18 per cent of part-time teachers received their pedagogical training under the new system. A total of approximately 69 per cent of the full-time teachers are formally qualified.

Teacher training for vocational institutions is comprised of the basic elements presented in the following list. In the three forms of teacher training mentioned above, these elements are structured in different modes and to different extents.

Training of vocational subject-matter teachers

Basic degree. The basic degree may be either a degree from a vocational institution, or from an institution of higher education, which gives a person the necessary mastery of his own vocational field or general education subject(s).

Work experience. The objective of work experience is to strengthen the vocational competence acquired with the basic degree, and to develop social readiness. Work experience should give one a feeling for the different vocations and organizations within a given field. It also has to provide practical experience of the central jobs in the field and of the materials, tools, and equipment used and their development.

General pedagogics. The task of general educational science is to form an overall picture of education and training as a whole. It comprises the following parts: educational sociology, educational psychology, the history of education, and planning for education. General educational science can be common to all teacher training.

Vocational pedagogics. Vocational educational science treats the fundamentals of vocational training as part of general social and educational policies, the linkages between training and the job market, questions related to syllabuses for vocational training, and general teaching arrangements and methods. Vocational educational science is, however, a clearly separate line from general educational science, because its area of emphasis is in the analysis of the regulations and developments of the job market and their translation into objectives for training.

Vocational didactics. Vocational didactics is defined as the art of teaching applied to the contents of vocational subjects. Here the aim is to learn to use methods of general and vocational educational sciences as applied to vocational fields. In the context of vocational didactics, the purpose is also to deepen the knowledge and skills of vocational subjects, emphasizing instructional aspects and clarifying the objectives and means for attitude education in the context of applications by fields.

Support subjects. These elements are defined as those separate content elements that are not included in the above five divisions. For example, instruction that has the purpose of developing the knowledge of future teachers of school administration, or work safety, or their communication skills in general, or from the point of view of their particular field.

Training of general teachers

The training of general-subject teachers can follow, in principle, the structure presented above for the training of vocational teachers. The basic teacher's degree, then, is a degree of an upper secondary school subject-matter teacher or equivalent, when general educational science is included in the basic degree. Vocational educational science could then be an introductory course for vocational education. Subject didactics also forms part of the basic degree.

Hungary

Jenõ Földi

Profile of second-level education

Structure of the system

As shown in Figure 1, secondary education in Hungary consists of one stage alone. Within this stage, however, exist several pedagogical institutions with different goals and levels of education, notably: (a) high school (four years), (b) secondary technical school (four years), (c) college of vocational education (three years), (d) shorthand/typing schools (two years), and (e) secondary vocational health schools (three years).

In accordance with Law No. III of 1961 of the People's Republic of Hungary, the passage from one type of educational institution to another is possible in certain determined conditions.

Those who have successfully completed their studies in high school may hold jobs that require a general secondary education. Those who have completed a secondary technical school have the right to jobs requiring a given specialized secondary training. These students may pursue their studies in higher educational institutions on condition that they have received a baccalaureat in one of the two types of scholastic establishment.

The foregoing applies in the case of workers pursuing correspondence education or evening courses. Those who attend one of the types of schools mentioned under (c), (d) or (e) cannot continue their studies in a higher-education institution unless they have completed their studies in one of the four-year secondary schools, either in evening courses or correspondence courses, and have successfully passed the baccalaureat.

Enrolment

Figure 1 shows the progress through the school system from the first class of primary school. The proportion of boys and girls in the total number of secondary students, according to types of institution was as follows:

High school: total, 87,293; girls, 58,091 or 66.55 per cent.
Technical high school: total, 105,879; girls, 54,699 or 51.66 per cent.
Vocational schools: total, 152,732; girls, 15,059 or 10 per cent.
Secondary vocational health schools: total, 5,059; girls, 100 per cent.
Typing/shorthand schools: total, 2,818; girls, 100 per cent.

In post-secondary institutions in normal courses, evening courses and correspondence courses, for the school year 1978/79 the total number of students in the first year was 30,632; in the last year, 27,464. In all post-

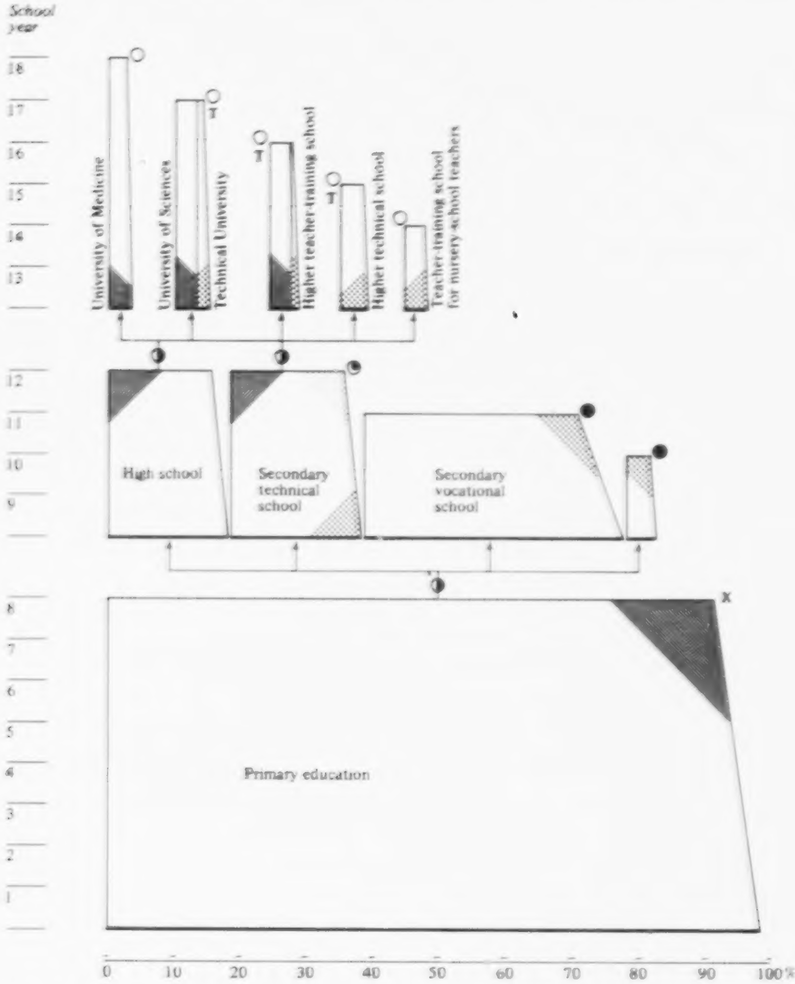

School year
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
University of Medicine
University of Sciences
Technical University
T
Higher teacher-training school
T
Higher technical school
T
Teacher-training school for nursery-school teachers
High school
Secondary technical school
Secondary vocational school
Primary education
x
0
10
20
30
40
50
60
70
80
90
100%

FIG. 1. The Hungarian school system.

secondary education institutions in the school year 1978/79 the total was 106,926, with 65,660 students in normal classes, 9,476 in evening classes, and 31,790 in correspondence courses.

In high schools, 43,917 students were taught according to the reformed curriculum in sixteen subjects over a period of four years, and 1,745 students participated in practical work in a total of twenty-seven professions.

Workers who study through evening classes or correspondence courses have the same possibilities of education and training as the students in normal courses. Thus, for example, in the school year 1978/79 in the four classes of high school there were 37,723 workers and in the four classes of other secondary schools 45,731, for a total of 83,454.

There are no evening or correspondence courses at the University of Medicine and at the Faculty of Pharmaceutics. Under the Hungarian education system, the pursuance of studies in higher educational institutions is linked to the entrance examination.

☐	*Indicates separate categories of institutions within the education system*
☐	*Indicates presence of technical and vocational subjects within the general education curriculum*
◪	*Indicates comprehensive institutions*
▨	*Indicates institutions exclusively for technical and vocational education*
⬚	*Indicates institutions for technical and vocational education outside the formal education system*
→	*Indicates normal routes through the system*
⇢	*Indicates second or unusual routes through the system*
◑	*Indicates examinations required to obtain recognition of successful completion of one level of education before proceeding to the next level*
○	*Engineering or professional qualification*
◔	*Technician or middle-level qualification*
●	*Skilled worker or craftsman qualification*
T	*Teacher qualification*
X	*No qualification*

Key to Figure 1

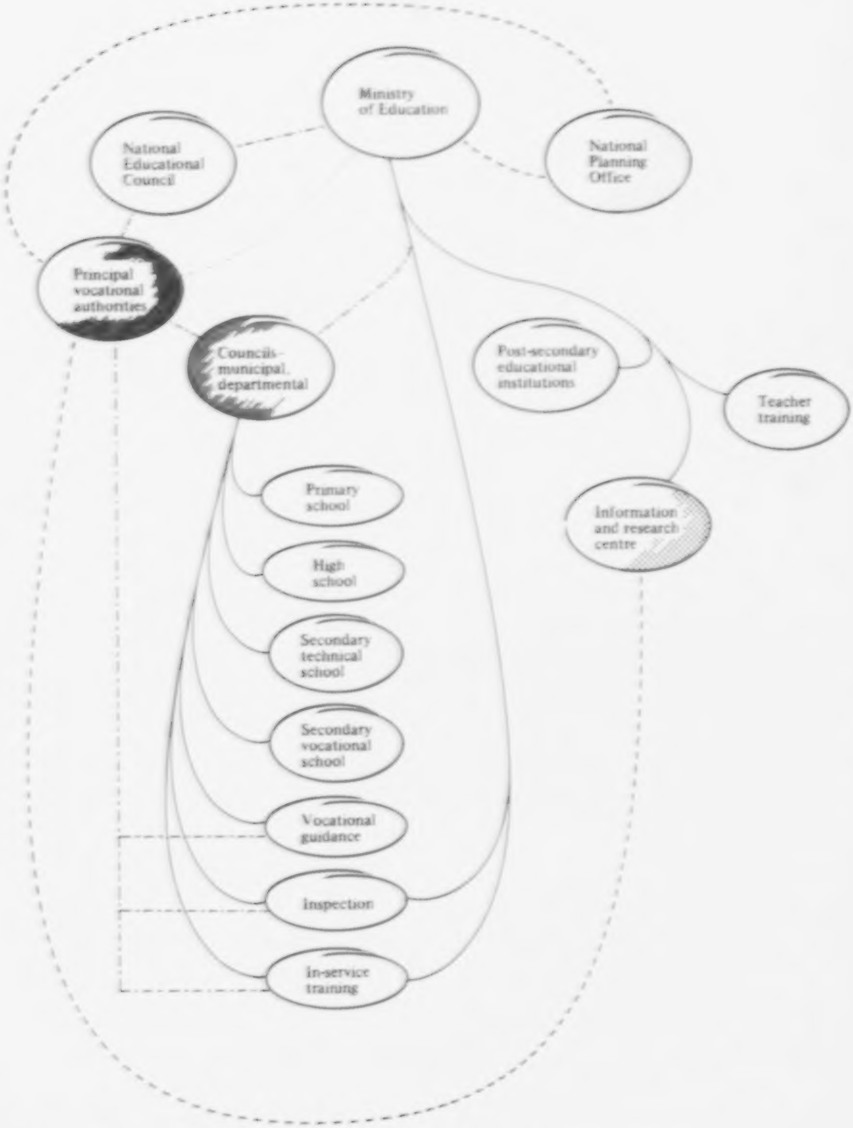

Ministry of Education
National Educational Council
National Planning Office
Principal vocational authorities
Councils - municipal, departmental
Post-secondary educational institutions
Teacher training
Information and research centre
Primary school
High school
Secondary technical school
Secondary vocational school
Vocational guidance
Inspection
In-service training

FIG. 2. Theoretical model of the structure of the education system.

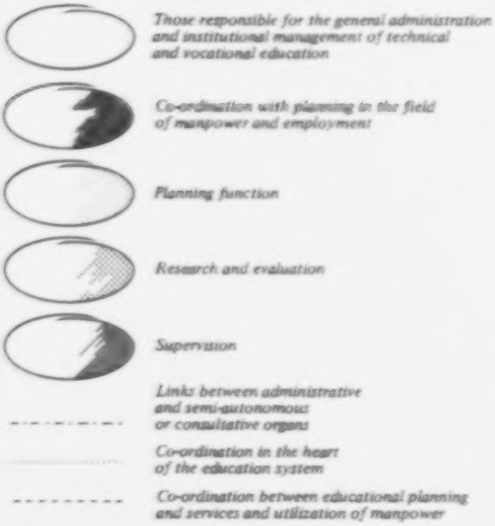
All public education expenses are paid by the state. The sum paid to this end is distributed among the various councils maintaining the schools and managing their budgets.

Policy of secondary education: its formulation and trends

The principal authorities involved—the Committee for Public Education of the Hungarian Academy of Sciences and other scientific institutes—are asked, in all cases and at all levels of education, to give their opinion on draft laws and Orders of Council. These draft laws and orders are presented to the public for discussion in certain cases. A pre-legislative working committee, taking into account the remarks and suggestions made, then prepares the ratification to be made by the appropriate organs of state.

Hungarian secondary education and, within that context, the nature and content of secondary vocational education are undergoing a fundamental adjustment and a gradual transformation. The new character and content are principally determined by the following objectives:

The treatment, acquisition and application of knowledge, skills and activities of a more concrete nature, closer to daily life.


Those responsible for the general administration and institutional management of technical and vocational education
Co-ordination with planning in the field of manpower and employment
Planning function
Research and evaluation
Supervision
Links between administrative and semi-autonomous or consultative organs
Co-ordination in the heart of the education system
Co-ordination between educational planning and services and utilization of manpower

Key to Figure 2

The more careful utilization of students' capacities and aptitudes, in order to insure their individual development and enhance the possibility of advancement in their professions.

Development of a capacity to adapt to new situations.

Maximum consideration of needs in work and all other activities carried out by oneself and by others.

Increased awareness of the goals to be reached and of the activities necessary to do so.

As a result, elementary and secondary vocational training should be based on general education of a higher level than that of today. The duration of such education determines the ways, content and system of vocational training. One solution could be to increase the duration of general education from eight to twelve years. In this way, a unified public education could be achieved that would serve as a basis for elementary, secondary and higher level vocational training. The advantage would be the choice of a profession at a more mature age.

In the case of higher education, this would provide a larger base of selection. The solution, however, could encounter several obstacles concerning, for example, the endurance of the national economy, an accrued need for school classrooms, the training of teachers, etc.

At present, in several European countries, vocational training at elementary and secondary levels is already based on general education of ten years. We also believe in the necessity of creating a scholastic regime that, in a period of ten years, provides both general and vocational education and insures the acquisition of basic, universal knowledge and skills. With this in view, numerous factors and possibilities must be taken into consideration.

The national education system in Hungary cannot be fully represented by the data given in Figure 2. This is because in secondary level education (above all as regards vocational education) there are several higher authorities at national level who have both the right and the obligation to participate in carrying out the organization and planning of educational subjects and management. In the planning and management of vocational training, the principal authorities can be considered as equivalent. Their tasks and competencies are regulated by laws and orders of council. According to the 1971 legislation on councils, however, these functions can only be exercised through the councils that are directly responsible for the maintenance and the management of the schools. We have therefore tried to represent the organization of these functions through the links contained in Figure 2.

The centre of pedagogical information is the National Pedagogical Library and its museum, which is the centre for the collection and dissemination of national and international pedagogical literature.

The principal authorities carry out studies, through research centres and independent departments, on the situation of vocational training and on the main trends in its development.

Major issues

The country's need for specialists has to be taken into account when establishing the framework for secondary education.

In Hungary all youth have an opportunity to work. Unemployment does not exist.

The proportion of those abandoning their secondary studies is represented in Figure 1. Dropping out of school can result from students' inability to meet requirements and from students voluntarily changing professions or types of school, or entering the labour market as unskilled (non-specialized) workers. School-leavers can resume or continue their studies at any time, in any type of school, in evening courses or by correspondence.

Regulations in the different types of schools determine the necessary conditions for completing the course of studies. Students having completed their studies in secondary vocational schools, for example, must, on entering employment, be able to meet the requirements of quality and quantity demanded of qualified workers in the initial stage.

As conditions of preparation in primary education vary, certain students find themselves in a disadvantageous situation at the beginning of their secondary studies. To reduce this disadvantage, such students can easily find places in colleges where they are afforded special attention.

The opening up of the scholastic system in Hungary has resulted in eliminating segregation by sex. Obviously, however, the natural division of work according to sex is reflected in the system's structure. (See Figure 1.)

In post-secondary educational institutions, the written entrance examinations correspond to those of the baccalaureat in the same subjects.

Integration at the first stage of secondary education

Since there is only one stage in Hungarian secondary education, answers to some of the questions posed in this context will be given under other appropriate headings.

Figure 1 shows how a certain selection is effected at the beginning of secondary education, although, in principle, each student is free to choose the type of school best suited to his aptitudes and capacities. However, given that the number of students accepted is determined by social interests, this choice is, in effect, not without limits (in order to effect economy of manpower).

Curricula

The educational programme (curriculum) is generally an obligatory document. Divergences in pedagogical practice are not admissible either with regard to the number of hours or to the essence of curriculum content.

The new curricula for secondary schools consist of four units:

Basic principles. Description of social requirements to be met by those who have completed their studies in a given type of school, as well as a description of modern educational methods permitting the fulfilment of established educational needs.

The educational programme in the classroom and outside the school. This establishes the pedagogical principles for forms of education in the classrooms and outside the school.

Listings of educational and training objectives in given types of schools, requirements, time-tables, job possibilities after schooling and material and personnel requirements necessary to the school's functioning.

The structure of curricula for each subject: (a) the subject's objective, (b) the subject's programme, (c) proposals, suggestions, instructions, and (d) equipment list.

The curricula make no distinction between boys and girls in relation to the level of the acquisition of knowledge. The requirements are the same for all students.

The number of elective courses is generally from two to eight lessons per week, according to the type of school.

In all secondary-education establishments, the subjects are predetermined and are compulsory, with the sole exception of elective subjects, which fall into two groups in the high school: compulsory electives (12.1 per cent) and freely chosen electives. The subjects in the latter category may only be taken after the obligatory number of course hours.

In both types of secondary vocational schools, the compulsory elective subject chosen in the final year consists of two hours per week. In the case of those who intend to continue their studies in a post-secondary technical or vocational educational institution, this subject should be one included in the entrance examination of the school concerned and, in the case of others, a theoretical or practical vocational subject.

Methods and materials

The nature of the demonstration equipment utilized in vocational education and the way it is used are extremely heterogenous. The proportion of centrally manufactured equipment is only a small proportion of the total amount of materials in use. Equipment produced by teachers in the schools is more numerous and varied and better adapted to local particularities. (Naturally, schools may buy projectors, tape recorders, educational films, etc. available commercially, and charge such items to the central budget. Almost all schools are equipped with material of this kind.)

The variety of such materials is a result of the complexity and variety of the subjects taught. It is fortunate that there is no lack of these materials in the schools despite their diversity, although, having been locally made, they are not always sufficiently up-to-date.

As in the case of demonstration equipment, school facilities, including workshops and laboratories, are not the same everywhere. Despite the fact that the workshops and laboratories of vocational schools (above all those with a large number of students, 1,000 to 2,000) are equipped from the central budget with operating machines, tools, etc., educational needs for facilities cannot be satisfied, as only a limited number of students can be accommodated. The majority of students can therefore only practice the procedures learned in modestly equipped factory or school workshops.

The obligatory curricula for secondary vocational schools in Hungary are established by the competent ministry. The result of this obligatory structure of the curricula is that, within a certain subject, the objectives, content and level of requirements are interpreted and executed in the same way in all schools.

The curricula, however, only propose the methods and equipment necessary for the treatment of a given subject, that is to say, teachers are invited to choose and to determine for themselves the most appropriate and efficient ways of teaching and learning, taking local factors into account.

Teachers

There are no direct and institutional relationships between the training of teachers destined for general education and that of teachers of technical and vocational education. Despite the fact that the training of teachers falls under the theoretical administration and control of the Ministry of Education, it is in fact the universities and the higher education institutions chosen for the training that prepare the future teachers.

The general social and educational objectives of all higher schools and universities responsible for the training of teachers are based on a common educational philosophy. Accordingly, the spirit and the character of the university undertaking the training are reflected in the content of the teacher-training curriculum, even if the pedagogical disciplines also play an important role. In other words, the scientific universities give

Table 1. Curriculum outline. Type of institution: technical high school. Level: secondary. Section: metallurgy and smelting metallurgy

Subject groups	Subjects	Periods weekly												Total	%
		1			2			3			4				
		○	◒	●	○	◒	●	○	◒	●	○	◒	●		
General	History	2			2			2			2			8	5.4
	Basic political and economic conceptions	–			–			–			2			2	1.4
	Hungarian language and literature	3			3			3			3			12	8.1
	Russian language	2			2			2			2			8	5.4
	Physical education	3			3			2			2			10	6.8
	Principal teacher's lesson	1			1			1			1			4	2.7
Basic science	Mathematics	5			5			4			2			16	10.8
	Physics	2.75	0.25		2.75	0.25	–	–			–			6	4.0
	Elective subject (physics, chemistry)	–			–			–			2			2	1.4
General technical	Industrial drawing	3			2			–			–			5	3.4
	Mechanics	–			3			–			–			3	2.0
	Electrotechnics	–			–			2.5	0.5		–			3	2.0
	Work protection	1			–			–			–			1	0.7
	Chemistry	1.3	0.7		2.3	0.7		–			–			5	3.4
	Production economy education	—			–			–			2			2	1.4
	Technology/knowledge of materials and fabrication	4	–	–	3			–			–			7	4.7

Special technical	Thermotechnics	–			–			2			–			2	1.4
	Knowledge of management & organization	–			–			–			2			2	1.4
	Mechanical knowledge	–			–			3			–			3	2.0
	Metallurgy	–			–			4			3			7	4.7
	Industrial drawing for metallurgy	–			–			3			3			6	4.0
	Mechanics of metall.	–			–			–			3			3	2.0
	Workshop/laboratory	–	2	–	–	2	–	–	3		–	3		10	6.8
	practice	–	–	6	–	–	5	–	–	5	–	–	5	21	14.2
Total classroom periods		28.05			29.65			28.5			29			148	100
Total lab. periods			2.95			2.95			3.5			3			
Total workshop periods				6			5			5			5		
Total practice			8.95			7.95			8.5			8			
Weekly general total			37			37			37			37		148	

○ Classroom ◒ Laboratory ● Workshop

TABLE 2. Curriculum outline. Type of institution: secondary vocational school. Level: 9, 10, 11. Section: fitter-maintenance, locksmith/blacksmith.

Subject groups	Subjects	Periods weekly						Total	%
		1		2		3			
		○	●	○	●	○	●		
General	History	1		1		2		4	3.4
	Hungarian language and literature	1		2		2		5	4.3
	Physical education	2		2		1		5	4.3
	Principal teacher's lesson	1		1		1		3	2.6
Basic science	Mathematics	3		2		2		7	6.0
	Physics	2		2		—		4	3.4
Technical	Protection in the work environment	1		—		—		1	0.9
	Industrial drawing	2		2		2		6	5.1
	Knowledge of fabrication	2		1		1		4	3.4
	Professional skills	3		3		5		11	9.4
	Mechanics	—		2		—		2	1.7
	Management techniques	—		—		1		1	0.9
	Economy of production	—		—		1		1	0.9
	Professional practices		21		21		21	63	53.8
Total classroom periods		18		18		18			
Total workshop periods					21		21		
Weekly total			39		39		39	117	

○ Classroom ● Workshop

preference to knowledge of the social sciences and the exact natural sciences, the technical universities to technical knowledge, the agricultural universities to the sciences related to agricultural production and corresponding methodologies. (See time-table for teachers of engineering in Table 3.)

The council responsible for a given school (municipal, departmental) is also responsible for the in-service training of its teachers. Each council maintains an in-service teacher training institute whose main task is to propagate the most appropriate pedagogical methods and equipment, taking into account local needs and possibilities. The principles and the content of in-service teacher training is established by the National Pedagogical Institute. The responsible body for the in-service training of

TABLE 3. The training of teachers of engineering in the Technical University of Budapest, from school year 1971/72 (correspondence course)

Subjects	Number of hours during one semester			
	1	2	3	4
Logic and theory of knowledge	6 + 3	—	—	—
Ethics	—	6 + 3	—	—
Psychology	6 + 6	6 + 3	6 + 4	—
Pedagogy	6 + 3	6 + 3	—	—
Didactics	6 + 6	6 + 3	6 + 4	6 + 4
Methodology	—	—	6 + 4	8 + 6
History of education	—	—	6 + 0	6 + 0
School and work hygiene	—	6 + 3	—	—
Organization of the school and politics of culture	—	—	—	6 + 0
Pedagogical practices	—	—	0 + 12	0 + 12
Hungarian orthology	6 + 4	—	—	—
Computer technics	9 + 6	9 + 9	—	—
Scientific-technical bases of modern industrial development	9 + 0	9 + 0	—	—
TOTAL	72	72	48	48
Number of examinations	4	5	3	4
Number of grades on practical work	1	—	—	—
Number of final examinations	—	—	1	—
Number of signatures	2	1	1	1
Number of reports	—	1	—	—

Subjects of the state examination: 1. Pedagogy
2. Didactics
3. Methodology

teachers in technical and vocational subjects is the principal authority competent in that particular branch.

Generally speaking, there is no difference in Hungary between the qualification and status of teachers in general education and those in technical and vocational education. Nevertheless, the status of technical teachers in technical and vocational institutions and the status of those teaching subjects of general knowledge in high schools follow the local order of values.

Guidance

In accordance with a governmental decision, vocational guidance is carried out by local (municipal, departmental) offices functioning under the control and the co-ordination of the National Office for Vocational

Guidance of the Ministry of Labour. This office also furnishes the local offices with information related to the manpower situation, methods and equipment employed in guidance and knowledge and results of national and international research carried out in this field.

In 1972, the Ministers of Labour, Culture and Health and the President of the Office of the Council of Ministers set out guidelines for vocational guidance for youth and for the development of a system of pedagogical and vocational guidance. The local vocational guidance offices mentioned above are equipped with the necessary material providing information on job possibilities, are staffed by vocational guidance officers and apply modern methods for the psychological study of the personality and individual aptitudes. The Institute of Research on Labour (which falls under the control of the Ministry of Labour) carries out research in the field of the psychology and physiology of work and on ergonomics, parallel to research on the probable structure of manpower in the future.

Integration at the second stage of the secondary level

Again the reader should remember that there is only one stage in Hungarian secondary education.

Educational legislation ensures that secondary educational institutions are available and that students may work during their studies. Students undergo a four-week period in production after the school year. This period, which also serves to facilitate vocational preparation, is stipulated in the curriculum. In addition, students of secondary educational institutions do industrial or agricultural work (for a maximum of twelve days) during the school year.

In addition to the information given in the paragraph on equipment, it should be pointed out that in Hungary's school system, and above all in respect of vocational training, self-learning packages and programmed instruction (machines, equipment) are not widespread. Secondary educational institutions giving general training are experimenting with such packages and using, sometimes successfully, programmed instruction in the learning of foreign languages, nevertheless it is the so-called 'traditional' (communicative) methods that are the most widespread in general education, although enhanced by the most modern presentation and demonstration.

As already stated, the majority of young people learning a profession cannot practice in school workshops, owing to a lack of facilities. These students can learn a profession directly in the factories. Fortunately, some central learning workshops and laboratories have been created in the capital and in several large cities where education is carried out through continuous utilization and well-organized groupings. In this way, many more students may benefit from an organized training in special workshops.

Practical instruction in technical and vocational learning workshops belonging to schools follows the curriculum. In this practical work, the students have a salaried job in line with the tasks specified in the curriculum, while they produce simple objects and equipment for educational demonstration. It is regrettable that this method is not yet widespread.

The regulations in technical and vocational schools precisely determine the administrative activities and the necessary professional management for practical work carried out in the school and factory workshops. These regulations determine personnel conditions in the schools.

Selection

The requirement for admission to secondary education is successful completion of elementary school. Achievements in elementary school are a determining factor in the subsequent orientation of school-children.

The entrance requirements for higher-education institutions are as follows: (a) passing the baccalaureat in a four-year secondary-education institution and (b) passing the entrance examination in a higher-education institution.

If the number of candidates exceeds the number of places, preference is given to those having the highest number of points. In general training, vocational experience is not one of the entrance requirements to higher-education institutions.

Transition between school and work

There is a ministerial decree designed to facilitate the transition from school to active life. In line with this decree, the schools make arrangements with factories so that the latter ensure practical instruction for students and their engagement later on. These factories occasionally give scholarships, grants and other allocations to students.

The work in secondary technical and vocational schools is closely related to defined areas of the national economy. The schools have a relationship, established by decree, with one or several factories. This relationship is bilateral: the factory is responsible for the material conditions of the practice period in the factory and the school in turn contributes to the recruitment of specialists.

In the curricula of secondary vocational schools, factory visits are linked above all to practical work. Such visits contribute to informing students about their specialty. In the high schools, study excursions are organized as a sort of preparation for employment. In addition, work camps are organized in the summer and work in the fields in autumn. All this permits youth to understand employment possibilities better.

Students having finished secondary school may freely choose their place of work. In certain professions, they may also have a civil contract whereby the employer sponsors the student on condition that, after completing school, he goes to work in the enterprise with which he has signed the contract.

The decree of the Council of Ministers of 1 January 1977 regulates the placement of students having completed their studies in higher-education institutions. Under this legislation, placement of students is subject to a national competition, with the exception of students who already have a contract with an institute or an enterprise.

Pakistan

Mohammad Aslam Popalzai
and Khadim Ali Hashmi[1]

Profile of second-level education

Structure of the system

The structure of the education system of Pakistan is represented graphically in Figure 1. Education up to B.A. level is the responsibility of the provincial governments. Most of the institutions are state-administered except for a few English-medium institutions in the larger cities. Table 1 presents the stages.

According to the provisions of the National Education Policy and Implementation Programme 1979, the following amendments to the above structure are envisaged. 'The present four-tier system of education, namely primary, secondary, college and university, will be replaced by a

TABLE 1. The various stages of the general education system

Proposed structure	Existing structure
Elementary	Primary stage classes I–V; age on entry: 5 years.
	Middle stage classes VI–VIII; age on entry: 10 years.
Secondary	Secondary stage classes IX–X; age on entry: 13 years.
	Intermediate/Higher classes XI–XII, secondary stage; age on entry: 15 years.
University	Degree classes, B.A., B.Sc., classes XIII–XIV; age on entry: 17 years.
	University Education M.A./M.Sc./Higher Research/Higher Education.

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[1] Most of the information given here is based on official documents, but the views expressed are those of the authors and in no way represent the official positions of their organizations nor of the Government of Pakistan.

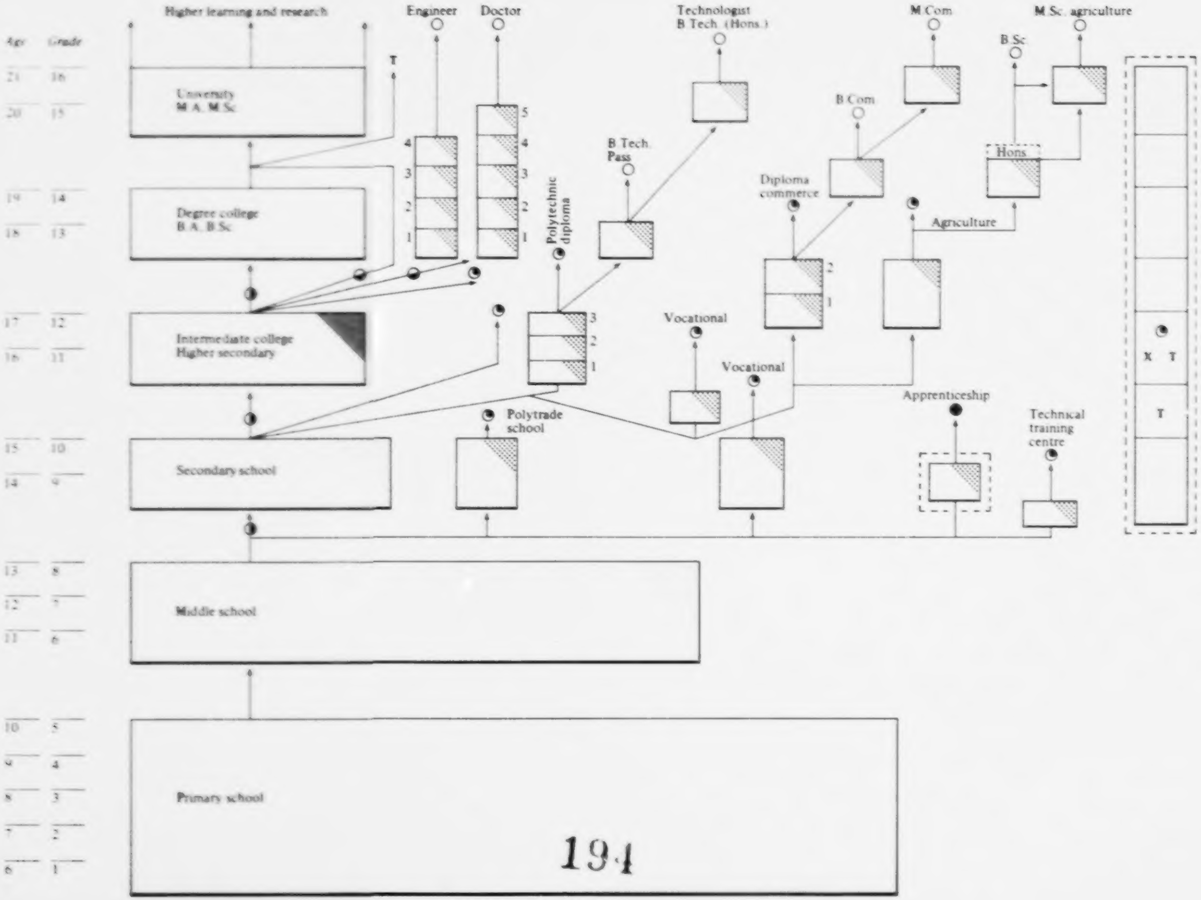
Higher learning and research
Engineer
Doctor
Technologist
B.Tech. (Hons.)
M.Com
M.Sc. agriculture
B.Sc
Age
Grade
T
21
16
20
15
University
M.A. M.Sc
4
3
2
1
5
4
3
2
1
B.Tech.
Pass
B.Com
Hons
19
14
18
13
Degree college
B.A. B.Sc
Polytechnic
diploma
Diploma
commerce
Agriculture
2
1
17
12
16
11
Intermediate college
Higher secondary
3
2
1
Vocational
Vocational
X
T
T
Apprenticeship
Polytrade
school
Technical
training
centre
15
10
14
9
Secondary school
13
8
12
7
11
6
Middle school
10
5
9
4
8
3
7
2
6
1
Primary school

FIG. 1. The education system of Pakistan.

three-tier system of elementary, secondary and university, in a phased manner.'

At present there are primary schools (classes I-V), secondary schools (classes VI–X), colleges (classes XI–XIV) and university teaching departments. In addition, there are middle schools (classes VI–VIII) and intermediate colleges (classes XI–XII). Under the proposed structure, the primary and lower secondary (or middle stage) will together constitute the elementary stage (classes I–VIII); the secondary stage (classes IX–XII) and university education will follow the present intermediate (or higher secondary) level.

For the purposes of this report, we shall confine ourselves to the prevailing system and include the lower secondary (classes VI–VIII), secondary (classes IX–X) and higher secondary (classes XI–XII) levels in our discussion.

□	*Indicates separate categories of institutions within the education system*
□	*Indicates presence of technical and vocational subjects within the general education curriculum*
◪	*Indicates comprehensive institutions*
◩	*Indicates institutions exclusively for technical and vocational education*
⬚	*Indicates institutions for technical and vocational education outside the formal education system*
→	*Indicates normal routes through the system*
⇢	*Indicates second or unusual routes through the system*
◑	*Indicates examinations required to obtain recognition of successful completion of one level of education before proceeding to the next level*
○	*Engineering or professional qualification*
◔	*Technician or middle-level qualification*
●	*Skilled worker or craftsman qualification*
T	*Teacher qualification*
X	*No qualification*

Key to Figure 1

TABLE 2. Enrolment in general educational institutions by class and sex for 1977/78

Grade/class		Total	boys	Girls
Lower secondary	VI	498 550	374 153	124 397
	VII	465 132	357 031	108 101
	VIII	384 597	293 809	90 788
Secondary	IX	284 251	219 809	64 442
	X	238 052	184 319	54 733
Higher secondary[1]	XI	94 527	68 338	26 338
	XII	75 287	53 994	21 293

1. Figures are for the year 1976/77.
Source: Pakistan Education Statistics (1947–79). Islamabad, Research Wing, Ministry of Education.

TABLE 3. Number of secondary vocational institutions by type and sex (1977–78)

	Commercial	Industrial technical and vocational	Polytechnics	Technical teacher training	Teacher training schools	Colleges of technology	Total
Male	51	25	21	4	51	8	160
Female	—	61	1	2	18	–	82
TOTAL	51	86	22	6	69	8	242

Secondary-level enrolment

There are 5,062 middle schools (1,364 for girls), 3,302 high schools (896 for girls), 242 secondary vocational institutions (83 for girls) and 477 Arts and Science Colleges (130 for girls). The enrolment in various secondary classes is given in Table 2 and in graphic form in Figure 2.

The vocational institutions comprise students who have passed a public examination (secondary school certificate) after ten years of schooling. The following are the broad categories of such institutions: industrial technical and vocational schools, commercial schools, polytechnics, teacher-training normal schools, technical teacher-training schools and colleges of education. The latter have been converted from polytechnics and have B.Tech. classes.

Most of these institutions are government sponsored. The figures for enrolment in various types of vocational institutions for 1977–78 are given in Table 4.

TABLE 4. Enrolment in secondary vocational institutions by type and sex 1977/78

	Commercial	Industrial technical and vocational	Polytechnics	Technical teacher training	Teacher-training normal schools.	Colleges of technology	Total
Male	5488	2818	10182	141	2670	3574	24873
Female	7	5865	234	250	1914	—	8270
TOTAL	5495	8683	10416	391	4584	3574	33143

TABLE 5. Number of teachers in various types of institutions by sex 1977/78

Type of institution	Total	Male	Female
Middle schools	48364	33926	14438
Secondary schools	60790	42435	18355
Inter colleges	2288	1692	596
Commercial institutes	365	364	1
Industrial, technical and vocational	726	321	405
Polytechnics	674	656	18
Teacher training	733	450	288
Technical teacher training	44	23	21
Colleges of technology	266	266	—
TOTAL	114250	80133	34122

The teacher-training schools offer one-year training courses preparing primary-school teachers, after the secondary-school certificate. In some of the institutions, one-year certificates for elementary-school teachers (previously middle-school teachers) are offered after the Higher Secondary Certificate Examination (class XII). In addition, there are colleges of education, institutes of educational research where B.Ed., M.Ed. and Ph.D degrees are awarded. Such institutions have been omitted from the present discussion.

The commercial institutions offer one-year C.Com. and two-year D.Com. courses, after the secondary-school certificate.

The polytechnics award Diplomas of Associate Engineers (DAE) after three years' course of study. The entry requirement is the secondary school certificate.

The colleges of technology also offer two-year courses beyond the DAE, leading to a B.Tech. degree.

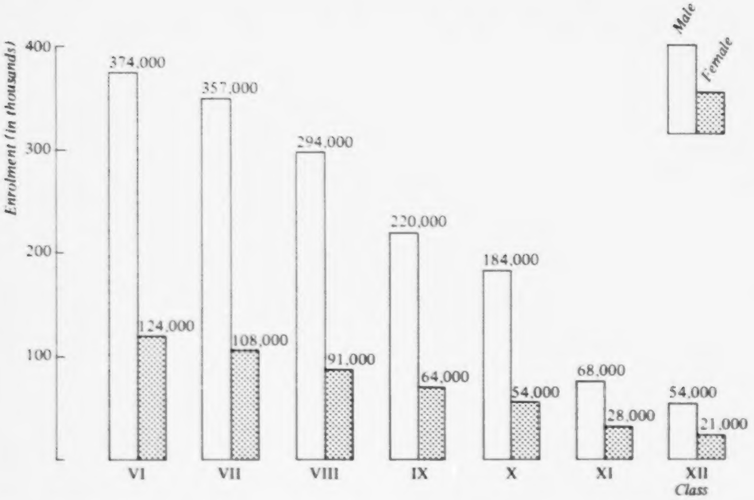

FIG. 2. Graphic representation of enrolment in various secondary classes (in thousands).

Administration

The Islamic Republic of Pakistan is a federation of four provinces, Punjab, Sind, North Western Frontier Province (NWFP) and Baluchistan, the Azad Jamu and Kashmir, Federally Administered Northern Areas (FANA) and Federally Administered Tribal Areas (FATA). The seat of the federal government is at Islamabad.

Each province is semi-autonomous in the administration of education, but decisions concerning such questions as the framing of curricula, educational policies, examinations and teacher education are decided nationally by the Ministry of Education in consultation with the provincial education departments. The administration of certain educational institutions is in the hands of the Federal Ministry of Education, as are the institutions in FANA and FATA.

The Federal Ministry of Education has five 'wings': the Administration Wing, the Institutions Wing, the Curriculum Wing, the Research Wing and the Planning Wing.

The universities come under the federal government (through the University Grants Commission), as do the Printing Corporation of Pakistan, the National Educational Equipment Centre, the National Book Foundation and the National Museum of Science and Technology (Fig. 3).

The Curriculum Wing, together with the Provincial Curriculum

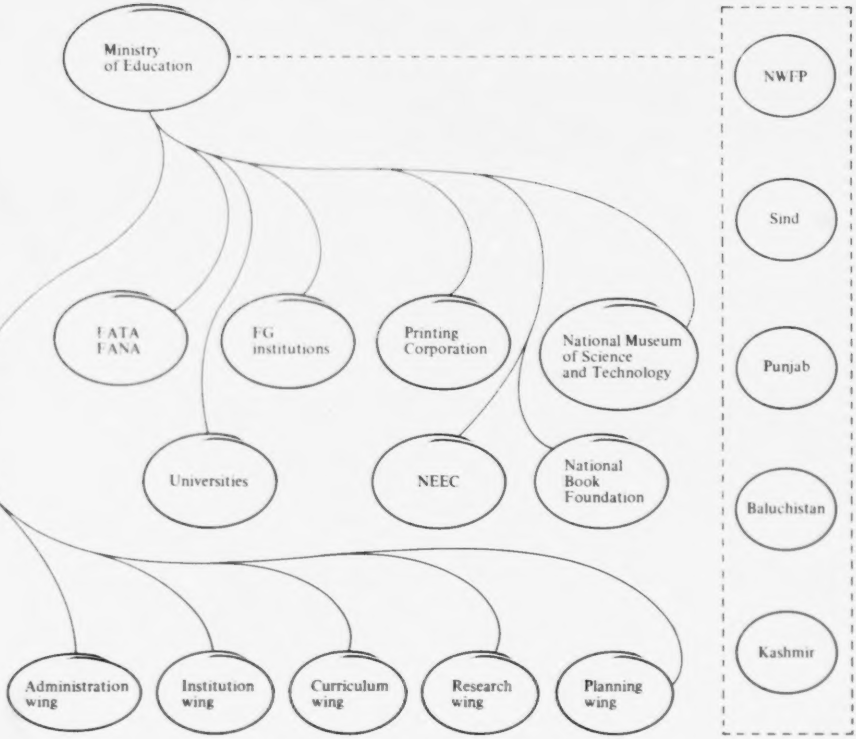
Ministry of Education
NWFP
Sind
Punjab
Baluchistan
Kashmir
FATA FANA
FG institutions
Printing Corporation
National Museum of Science and Technology
Universities
NEEC
National Book Foundation
Administration wing
Institution wing
Curriculum wing
Research wing
Planning wing

FIG. 3. Relationship of the Federal Ministry of Education with the provincial education departments. (FATA = Federally Administered Tribal Areas; FANA = Federally Administered Northern areas; FG = Federal Government; NWFP = North Western Frontier Province; NEEC = National Educational Equipment Centre, Lahore.)

Research and Development Centres, frames the curricula, trains teachers and arranges for the preparation of textbooks. The Provincial Textbook Boards publish the textbooks for classes I–XII for the institutions in their respective provinces.

Educational administration in the provinces

The provincial Secretary of Education is the executive head. The following organizations work under his authority (Fig. 4): Directorate of Public Instruction, Directorate of Curriculum Research and Development Centre, Directorate of Technical Education, Textbook Board, Board of Technical Education, and the Boards of Intermediate and Secondary Education (BISE).

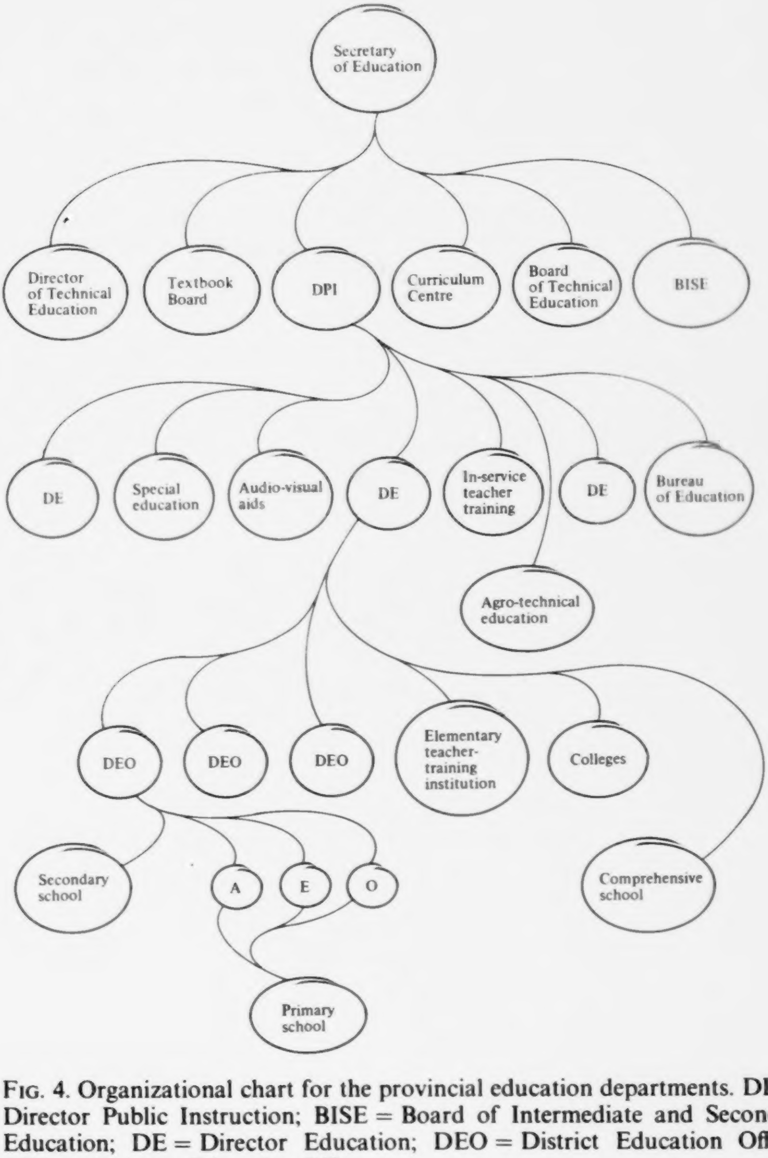
Secretary of Education
Director of Technical Education
Textbook Board
DPI
Curriculum Centre
Board of Technical Education
BISE
DE
Special education
Audio-visual aids
DE
In-service teacher training
DE
Bureau of Education
Agro-technical education
DEO
DEO
DEO
Elementary teacher-training institution
Colleges
Secondary school
A
E
O
Comprehensive school
Primary school

FIG. 4. Organizational chart for the provincial education departments. DPI = Director Public Instruction; BISE = Board of Intermediate and Secondary Education; DE = Director Education; DEO = District Education Officer; AEO = Assistant Education Officer.

The Director of Public Instruction is the administrative head of general education in the province. He administers education in the province through: Directorates of Education, Directorate of Special Education, Directorate of Audio-visual Aids, Directorate of In-Service Teacher Training, the Bureau of Education, and Agro-technical Education.

Each Director of Education (DE) is responsible for arts and science colleges, colleges of elementary education and the comprehensive schools/central model schools. The elementary schools are administered by the Assistant Education Officer, who in turn along with the Secondary/High School officer, is under the District Education Officer (DEO). The DEO is responsible to the DE.

Financial situation

Expenditure on education is calculated on the basis of school type. For example, the total allocation for middle schools will also include expenditure on agro-technical and pre-vocational subjects.

There is a separate allocation for female education, but some expenditure on female education is included in planning primary or mohallah schools which also receive separate allocations. The budget for technical education includes expenditure on purely technical and vocational institutions, whereas in the first stage of secondary education expenditure on pre-vocational and vocational subjects is met from secondary-education resources.

Pakistan being one of the poorer countries, with a per capita income of $120, the expenditure on education was 1.69 per cent of GNP in 1976. Estimates for financial requirements for the 1978–83 plan period are given below. Here the developmental expenditure on technical education is 766.8 million rupees and non-developmental 933.3 million rupees.

Policy of secondary education: formulation and trends

Secondary education plays a vital role in the present educational structure. It is both a terminal stage for a majority of students and a determinant of higher and professional education. The present four-tier system of education, namely primary, secondary, college and university, will be replaced in phases by a three-tier system of elementary, secondary and university. Classes IX and X will be added to all the intermediate colleges, while classes XI and XII will be added to selected high schools.

Physical facilities such as science laboratories, teaching and audio-

TABLE 6. Estimates of financial requirements for 1978–83 (in millions of rupees)

Sector	Subsector	Developmental Expenditure	Non-developmental expenditure	Total
1.	Primary	3 049.7	6 990.6	10 040.3
2.	Secondary	3 257.8	4 815.7	8 073.5
3.	Teacher	380.0	318.0	698.0
4.	Technical	766.8	933.3	1 700.1
5.	College	767.0	2 802.6	3 569.6
6.	University	725.0	1 307.3	2 022.3
7.	Scholarships	450.0	62.9	512.9
8.	Non-formal education (adult education)	50.0	3.0	53.0
9.	Production and supply of books	40.0	—	40.0
10.	Curriculum development	16.0	3.6	19.6
11.	Examination reforms	5.0	2.0	7.0
12.	Guidance and counselling	5.0	65.0	70.0
13.	Development of library services	36.0	6.0	42.0
14.	Development of museums	10.0	5.0	15.0
15.	Special education	23.0	10.0	33.0
16.	Miscellaneous	65.0	1 244.0	1 309.0
	Subtotal for education	9 646.3	18 569.0	28 215.3
Other programmes				
1.	Culture, archaeology and sports	575.0	40.0	615.0
2.	Programmes of planning division	18.0	—	18.0
3.	Programmes of establishment division	18.0	2.0	20.0
4.	Programmes of states and frontier regions division	9.0	2.0	11.0
5.	Programmes of religious affairs division	15.0	4.0	19.0
	Subtotal for other programmes	635.0	48.0	683.0
TOTAL		10 281.3	18 617.0	28 898.3

visual aids, and hostels will be provided to the secondary schools so as to bring them up to the same level as those available in urban institutions.

A wide range of curriculum offerings will be introduced at the secondary stage for greater diversification in line with students' aptitudes.

In spite of several efforts in the past, technical and vocational education is still not job-oriented. Moreover, there are hardly any arrangements for identifying the needs of, and providing training to, the rural population so as to make them more productive and strengthen this predominant sector. In order to improve technical and vocational education, it has been decided to introduce production-oriented curricula related to the market requirements in all technical and vocational institutes. Advisory committees including representatives of trade and industry will be constituted to keep training responsive to the changing market requirements.

All technical and vocational institutions will be encouraged to generate funds to supplement their resources by producing saleable goods during training. Small production units will be established in technical and vocational institutes for the benefit of the community, wherever needed. Separate vocational schools for drop-outs from the school system will also be established. Equipment needed for various levels of technical and vocational institutes will be standardized. A mechanism for standardizing, testing and certifying technical and vocational skills provided through formal, non-formal or traditional systems of training will be introduced in consultation with trade, industry and other users of the output of these institutions.

Practical on-the-job supervised training for diploma and B.Tech. students will be made compulsory, and the appropriate legislation for providing this training in industrial organizations and undertakings will be enacted. In order to provide close liaison with industry, the teachers in polytechnics and technical colleges will be encouraged to provide consultancy and advisory services to the industry. Personnel from industry will also be invited to advise these institutions on production methods. A teacher training college for the training of teachers of technical and vocational institutes will be established at national level.

With the establishment of over 150 technical and commercial institutions and more than 3,000 schools offering agro-technical education, new trends have been developed. Some of the educational institutions are very well equipped, and there is a considerable but underutilized potential in the form of equipment. This situation is mainly because the curricula are neither production-oriented nor suited to market requirements. Lack of the right type of trained teachers is also a serious problem. Pre-service teacher training in the field of technical and vocational education is non-existent. Teachers do not find the jobs attractive because their colleagues in industry and private businesses are higher paid and enjoy better service conditions. Moreover, technically trained personnel find better jobs outside Pakistan in teaching as well as in technical fields. There is no provision for on-the-job training.

Attitudes in respect of technical education are developed in the early stages. Individuals having excellent skills may be inadequate in reading and writing. Such people sometimes have great difficulty in adjusting themselves to society. There is no arrangement for standardizing the testing and certification of those who obtain skills informally although they contribute to the economic development of the country. With the change in society and the effect of technology, the demand for technical education has increased greatly. It has, therefore, become essential to organize technical education activities at various levels.

The existing levels of technical and vocational education in Pakistan are as follows:

Vocational: education and training, preparing men and women of pre- and/or post-matriculation level in over seventy vocations for employment as skilled craftsmen. They earn certificates from vocational or commercial institutes or institutions offering evening extension programmes.

Technical: education and training, mainly preparing men for post-matriculation diplomas in industrial and commercial education in over thirty vocations leading to employment as highly skilled supervisors or foremen. Diplomas are awarded by technical colleges or polytechnics or commercial institutions.

Professional: education, preparing men in about ten branches of engineering to be employed as designers, senior supervisors and decision makers of projects. They earn University degrees from Colleges of Engineering or Technology.

The following programmes will be implemented during the Fifth Five-Year Plan (1977–82):

The present allocation of five periods per week for classes VI to VIII in the field of agriculture, industrial arts and home economics will continue. While the main intent of this programme will be the teaching of skills, the curricula of polytechnics, vocational and commercial institutes, etc., will be made production-oriented.

Curricula for classes VI to VIII will continue to be designed for the teaching of skills at the rate of five periods per week in the field of agriculture, industrial arts and home economics, whereas curricula for polytechnics, vocational and commercial institutes, etc., will be production-oriented.

Advisory committees, including representatives of trade and industry, will be established by making appropriate changes in the structure of the Boards of Technical Education and Directorates of Technical Education.

Production units will be attached to a few selected institutions on an experimental basis. For this purpose, an amount of about Rs.1 million per institution will be sanctioned as a revolving loan and selected items will be produced and marketed. The funds thus realised will be utilised to expand the programmes with a view to making the institutions as far as possible self-financing. Such programmes are already functioning in other countries. If this experiment shows promise, it will be gradually expanded.

In order to utilize facilities more intensively, the existing evening extension programmes will be examined and improved. In the first phase the teaching will be based on the modular concept; during the second phase, part of the teaching will be provided through the Allama Iqbal Open University.

Separate schools for providing skills for the drop-outs have been proposed. As a start, five such centres will be established and in the Fifth Plan period about a hundred skill schools will be instituted. Programmes similar to the evening extension programmes, although with minor changes, will be adopted.

Standardized and illustrated lists of equipment giving full specifications will be prepared and institutions will be instructed to purchase equipment and supplies etc. in accordance with the lists.

A large number of persons are being trained in different skills through non-formal, traditional systems and are also studying abroad. Their conditions could be improved and salaries enhanced if some sort of certification of technical and vocational skills could be organized. For this purpose, Boards of Technical Education will be encouraged to determine the various levels of trades such as skilled and semi-skilled workers, artisans, craftsmen, supervisors, etc. An Inter-Board Technical Education Committee will be established for the testing and certification of skills acquired through non-formal educational structures.

Legislation will be enacted to provide practical training for engineering and technical graduates.

Technical teachers will be permitted to apply their knowledge in industry and business while technicians from industry will be encouraged to work in educational institutions. A planned programme to motivate experts, teachers, supervisors and engineers will be prepared and suitable remuneration, including travel expenses etc., will be paid.

A College for Technical Education will be established to provide pre-service training to teachers and to improve in-service training programmes. This college will also undertake such activities as establishing academic models for training, staff development, and preparation or translation of books needed for various levels of training.

Changes and prospects

The founder of Pakistan, Quaid-i-Azam Mohammad Ali Jinnah, expressed keen interest in the study of science and technical education because he saw this as the pre-requisite for economic development in the country. Four years later, when Pakistan's first educational development plan was formulated, it was decided that technical and commercial education could constitute an integral part of general education, while the curriculum of secondary schools could be diversified so as to embody technical and commercial content. In practice, it was decided to establish technical high schools as a parallel stream to the normal high schools, at that time known as 'academic schools'. At a later stage, further attempts were made to introduce such subjects as technical drawing, painting, modelling, cooking, dressmaking, etc. as part of the curricula. The 'academic schools' continued to enjoy a special position in the society.

Another major development in 1958 consisted of appointing a Commission on National Education to suggest ways whereby education in Pakistan might be given a new orientation to meet the needs and aspirations of the people. The commission recommended the establishment of more institutions in the fields of engineering, business, commerce, agriculture, home economics, etc. All these institutions started functioning parallel to the general educational institutions. Although their curricula were different the pattern of education remained identical. Universities specializing in agriculture and engineering were established, various polytechnics, commercial institutions and vocational institutions began providing the trained manpower needed by industries. Assistance in the form of personnel, technical know-how, equipment, books, training, etc., were provided by various countries and by such organizations as the World Bank, UNDP/Unesco, and the Ford Foundation. This brought about a significant change in the educational situation of the country, and industries of various kinds began turning raw materials into marketable products. The benefits from this industrialization, however, were not enough in as far as technology is changing at an unexpectedly rapid rate. Moreover, skilled personnel was attracted to the Gulf States so that highly trained manpower was lost to the nation.

Efforts were made to make the educational system more relevant to the socio-economic needs of the country. In 1972, a new education policy was announced that laid great emphasis on relating education to the world of work and integrating general and technical education so that horizontal movement from one to the other and vice versa was possible for students. In this connection, the following objectives of education policy are particularly significant:

To build up and nurture a total personality so as to develop a dynamic and creative individual, able to comprehend fully the nature of technical and social change and acquire a genuine concern for the improvement of society.

To design curricula relevant to the nation's changing social and economic needs compatible with its basic ideology and to provide a massive shift from general education to more purposeful agro-technical education.

To provide a comprehensive programme of studies through the integration of general and technical education by keeping options open for transfer from one course of study to another.

The policy envisaged a shift towards science and technology with the object of integrating general and technical education into secondary schools. It also envisaged an integrated science course. In this connection, the relevant extracts from the policy are reproduced below:

> In the past the general tendency has been to establish separate institutions for technical education. These institutions have not always produced efficient industrial workers. The education given lacked the necessary cultural content and, in practice, created a second-class education for rejects of the general stream so that a certain stigma was attached to these programmes. The new programme will provide for progressive integration of general and technical education.
>
> The integration of general and technical education will equip secondary and college students for gainful employment, including self-employment, for industry, agriculture, business, home economics and education in addition to providing a programme of general education. The areas of vocational occupational studies for which facilities will be developed include: electronics; auto-electricity; plumbing; household electrical appliances; dairy farming; poultry farming; vegetable farming; sericulture; crop and livestock production; shorthand; typewriting; insurance and estate broking; clearing; forwarding and shipping practices; home management; cooking and baking; first aid and home nursing; food production and preservation; etc....
>
> An integrated science course, including mathematics and biological and physical sciences, will be introduced at the higher and intermediate stages with a view to giving students a more comprehensive and diversified preparation enabling them to have a wider choice at the time of entry into higher institutions of professional and general education.

On the question of technical education, it was decided to convert polytechnics into technical colleges leading to a degree course. The importance of the world of work was recognized in the stipulation that for the purpose of admission to B.Tech. programmes, two years' practical work in industry would be considered an additional qualification.

In addition to the normal courses, various new areas of technical subjects were introduced, which include textile technology, paramedical training, mineral technology, printing and graphic technology, timber technology, oceanography and marine engineering, plastic and rubber technology, gas and petroleum technology, ceramics and glass technology, and development economics.

Major issues

Economic needs

Several reasons are generally advanced in support of 'vocationalizing' the curriculum offered in schools of general education, some of the most important being:

Integration of general and technical education ensures a better prospect of all-round development in the present technological era by combining intellectual training with productive, technical, aesthetic, physical and moral education.

Manual work in schools plays a significant part in moral upbringing as the students enter into a variety of relationships with their fellow students and become accustomed to team-work.

Since society largely enjoys the fruits of manual labour, each individual must become accustomed to physical labour so as to appreciate its real value.

The application of science and technology is a fundamental factor in the social and economic advancement of the masses. The education system must, therefore, play a part in creating a dependable base for developments in the scientific and technical fields through modifications of the programmes in line with the requirements of technological change and progress. The curricula offered as a part of general education must be extensively oriented towards science and technology even for professions not strictly scientific or technical. This is necessary to appreciate the impact of the technological revolution on ordinary life.

Most of the developing countries are characterized by a preponderance of the humanities in their educational systems whereas for achievement of their development goals they require a larger output of scientifically and technically qualified personnel. Employment patterns in most production activity exhibit a larger proportion of technicians and skilled workers. The present trends and attitudes towards training at levels other than higher or professional inhibit adequate enrolment in schools exclusively meant for producing skilled workers. Integrating general and technical education in general schools facilitates the development of correct attitudes towards technical training.

Judicious selection of vocational training in general schools can assist in reducing pressures on higher education as different stages can be made terminal in character. Through special guidance programmes, the bulk of the students can explore their areas of interest and leave the school for gainful employment before entering into higher education. This not only ensures an adequate supply of persons with technical skills but also improves the productivity of the education system.

There can be a continuous development of pupil's aptitudes through systematic vocational training right from the lower stages and this is very necessary for academic achievements even if education is continued up to the highest level.

Economies in the creation of physical facilities, the provision of staff and administrative overhead costs can be effected since facilities already available, such as class-rooms, physics and chemistry labs., staff for related subject, libraries, administrative blocks, etc., need not be duplicated. For administering technical subjects, only such specialized facilities as workshops and technical instructors may be required.

The National Education Policy lays down the following as one of its Aims of Education:

> To promote and strengthen scientific, vocational and technological education, training and research in the country and to use this knowledge for solid economic growth and development, thereby ensuring a self-reliant and secure future for the nation.

In order to achieve this aim, the Implementation Strategy suggests:

> Effective participation of the local community in the development and maintenance of educational facilities will be used to ensure that the educational needs of the remotest parts of the country are met in the shortest possible time at a minimum cost.

The Strategy adds that 'with due regard to the need for basic research, science and technological training should be linked with production in order to place scientific endeavour in the overall context of national reconstruction'.

It is thought that in due course the technical and vocational institutions will become self-financing. With the improvement of the service conditions of teachers, particularly those employed in the technical and vocational institutions, a check on the brain and skill drain from the country is also envisaged.

Social aspects

Over the last decade continuous efforts have been made to improve the social aspects of education. The problem of youth unemployment has been one of the major concerns in this field. Other areas in which efforts have been made concern the increase in the literacy rate, facilities for school drop-outs and provision of education through formal as well as non-formal channels as the basis of lifelong education.

Youth unemployment. In order to provide some means of livelihood for unemployed youth, such subjects as local community crafts, agro-technical activities, commerce, etc. have been introduced in general education.

The country is not sufficiently industrialized to provide technical job opportunities for every individual. With limited industrial and commercial openings, the only solution lies in the absorption of unemployed youth in the local community and in the agricultural based vocations. It is hoped that this will discourage migration of the rural population towards the big cities.

Drop-outs. The National Education Policy aims

> to provide a minimum acceptable level of functional literacy and fundamental education to all citizens of the country, particularly the young, irrespective of their faith, caste and creed, in order to enable them to participate productively in the total national effort. In order to achieve this aim, several steps have been taken, among them, opening of religious schools, mosque schools, village workshop schools, in addition to the non-formal structures like Radio/TV, Rural Development Programmes, Adult Education and the programmes of the Allama Iqbal Open University.

In order to revive the tradition of imparting education to young children by the older women in their own homes, religious schools are being set up throughout the country. The tradition of imparting education in the home is an ancient one in this part of the world, although it was largely overtaken by the opening of Western-type schools. The mohallah schools are being organized on the basis of a unit of twenty to thirty students; they emphasize the education of the girls and aim at imparting literacy skills, teaching of Islamic studies and selected home-management skills. By 1982/83, a total of 5,000 religious schools will be in operation.

The mosque has always played a central role in educating young Muslims. A total of 5,000 mosque schools will be established during the period of the Plan (by 1982/83).

Both the mosque schools and the religious schools will be accessible to drop-outs as well as to regular school-going children. The teaching programmes are of shorter duration in order to give children some free time to help their parents, as is customary in village society.

In order to convert primary-school drop-outs into productive members of society, it is planned to open 1,000 village workshop schools during the Fifth Five Year Plan period.

In the village workshop schools, training programmes, of one year's duration, will be adjusted to the immediate needs of learners. The training programme is to be based upon modular concepts and will utilize local indigenous materials for productive activities.

School-leavers. Several adult literacy programmes are in operation in various sectors of the community. Some of these programmes are organized by the Industries/Labour and Social Welfare Departments, others under the auspices of the Agriculture and Education Departments. The nature of these programmes differs from one to the other and from place to place, depending upon the needs of the target population and of the community involved.

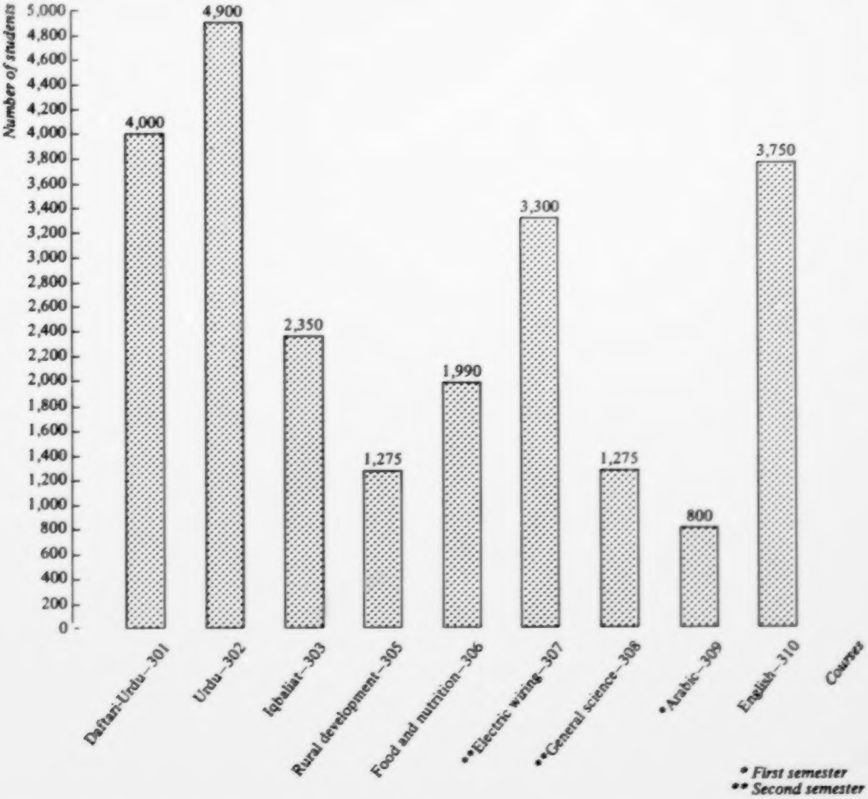

FIG. 5. Allama Iqbal Open University: enrolment in various courses during three semesters.

The opening of the Allama Iqbal Open University (AIOU) constitutes a major leap forward. The AIOU offers educational opportunities to early school leavers and combines training in vocational skills with certification. The university was established in 1974 and makes use of distance-learning media coupled with face-to-face tutorials and workshop support. The wide range of courses offered may be summarized under the following heads: (a) teacher education/in-service training, (b) general education, (c) technical and vocational education.

Even in the general education programmes, there are such course offerings as food and nutrition, bookkeeping and accountancy at the international level and accountancy at the B.A. level. There are also courses on a wide variety of technical and vocational subjects, such as: electrical wiring, electricity, kitchen gardening, plant protection, poultry

TABLE 7. Number of educational institutions in Pakistan by type, level and sex in 1947/48 and 1978/79 (T = total, F = female)

Year	Primary schools		Middle schools		High schools		Secondary vocational institutions		Arts and science colleges		Professional colleges	
	T	F	T	F	T	F	T	F	T	F	T	F
1947/48	8 413	1 549	2 190	153	408	64	46	18	45	5	19	2
1978/79	54 544	16 551	5 062	1 364	3 302	896	245	83	477	130	99	8

Source: Pakistan Education Statistics, 1947–79.

farming, soil problems and their solution, rural development, tractor maintenance, etc.

Early school-leavers are strongly attracted by these courses, and ever-increasing numbers of young men and women from all walks of life are applying for admission.

Democratization

Pakistan being an ideological state, there has been an ever-increasing shift towards adoption of the Islamic concept of equality of opportunity for the acquisition of knowledge. More than 50 per cent of the population is female. The National Education Policy has given high priority to the education of girls and women, and the country is witnessing a rapid expansion of female education at all levels. Certain institutions are purely for female students. Up to degree level (B.A./B.Sc. classes), institutions for girls are separate from those for boys. There are colleges of elementary education, colleges of education, medical colleges, polytechnic institutes and colleges of home economics that are solely for girls and have female staff. An idea of the increase in facilities for girls' education can be obtained from Table 7 which shows the number of educational institutions in the country by type, level and sex, in 1947/48 and in 1978/79.

At present, only 33 per cent of female children in the relevant age-group attend primary schools. At the middle stage (lower secondary), only 3 per cent of rural girls in the age-group 10–12 attended schools in Punjab, 7 per cent in Sind, and 1 per cent in NWFP and Baluchistan. High school female enrolment from rural areas is 0.5 per cent of the age-group 13–14 in Punjab, 2 per cent each in Sind and NWFP, and none in Baluchistan.

In order to improve the situation, greater emphasis has been laid upon elementary education, and universal primary education is to be achieved by the year 1992.

Besides the opening of new schools and improvement of facilities in existing institutions, mohallah schools are planned mainly for girls.

The following strategy has been spelled out in the Implementation Programme of the National Education Policy in respect of female education:

Special efforts will be made to expand and improve facilities for the education of females.

At the primary level, solid foundations will be laid to achieve universal education among females by 1992.

About 30,000 female teachers will be recruited for primary schools during the next five years to achieve this target. Education as a subject will be introduced in a sufficient number of intermediate colleges.

Nearly 5,000 mohallah schools will be established to impart literacy and selected home-management skills to girls. Depending upon the success of the programme, primary-education facilities for girls may be developed around this structure.

Enrolment of girls at the secondary stage will be increased from the present bench mark of 400,000 to 650,000.

Major stress will be laid on the improvement of facilities for the teaching of science and on the introduction of home-economics subjects.

Liberal scholarships and loans will be provided exclusively for females at all levels of education.

Six thousand female teachers' residences, mostly in the rural areas, will be constructed to attract women to the teaching profession.

Boundary walls will be constructed around 10,000 existing primary schools for female children.

Science laboratories, hostel places, and books will be provided in adequate numbers.

A greater share of funds will be apportioned to the education of females in all other programmes envisaged under primary education, secondary education, non-formal and adult education, vocational and technical education, teacher education, higher and professional education, etc.

For higher education of women, the scope of postgraduate courses, including home economics, will be expanded. To begin with, postgraduate classes will be introduced in selected women's colleges. The University Grants Commission will set up a committee to undertake a detailed study of alternative approaches to the establishment of womens' universities. The report of the committee will be circulated to the provinces before implementation of its recommendations. Initially, two women's universities, one at Lahore and the other at Karachi, will be established.

The programmes for the education of females will be implemented within the allocations made for the Fifth Five Year Plan for different subsections of education. However, additional funds will be required for the establishment of women's universities.

Examination system

The National Education Policy has given due importance to problems of evaluation and examinations. The semester system was introduced in higher and professional education. Problems connected with the 'falling standard of education' and the improvement of examinations have recently been the subject of several seminars, commissions, etc. Study groups have been working at both provincial and national levels. As a result of these studies, gradual reforms in the educational system are being introduced. The emphasis has shifted from the annual essay type to periodical objective modes of assessment. The reforms in the examination system are being considered within the totality of the educational system, perceived as comprising academic, organizational, political and socio-cultural dimensions. This four-dimensional analysis of the present situtation forms the basis of policy on evaluation and examinations.

The policy lays down the following programme for the period of the Fifth Five Year Plan:

Efforts will be made to eliminate malpractices in the conduct of examinations.

The existing system of terminal examinations for classes X and XII will be gradually improved. Ultimately terminal examination for classes X will be conducted on the basis of internal evaluation.

The progress of students will be determined on the basis of periodic-cum-annual examinations and continuous systematic internal assessment of the students' achievement, general behaviour and aptitudes. For this purpose, maintenance of cumulative records of each student will be made compulsory.

Implementation of examination reforms presupposes in-service training of teachers in methods and techniques of testing and evaluation. During the Fifth Plan period extensive programmes of in-service training courses for teachers of elementary and secondary levels will therefore be organized.

Admission procedures in respect of higher education institutions and professional colleges will be substantially improved to bring them to the same level as other advanced countries of the world. Since the public examinations in their present state only provide limited appraisal of the total behaviour of an individual student, an objective merit system will be introduced to ensure fairness and justice to all students irrespective of their social status. Admission to higher educational institutions and professional colleges will be granted on the basis of marks obtained in internal evaluation and public examinations along with the results of aptitude and admission tests conducted by the institutions concerned.

As a result of the gradual introduction of a system of internal evaluation, the boards will change from purely examining bodies to research-oriented professional bodies. Development and standardization of achievement, aptitude and admission tests would then become their major functions.

Close liaison will be established with the Institutes of Education, Colleges of Education, National Institute of Educational Research, National Institute of Psychology, University Grants Commission and public examining bodies to review policies and practices in connection with internal and external examinations.

A thorough review of the entire system, taking into account the evaluations made of both the external and internal systems, will be undertaken during the plan period. On the basis of the research findings, future lines of action will be determined.

The Fifth Five Year Plan provides Rs.5 million for development expenditure and Rs.2 million for non-development expenditure in connection with examination reforms (9.9 rupees = $1). Details of the expenditure are shown in Table 8.

TABLE 8. Development expenditure (rupees, thousands)

1978/79	1979/80	1980/81	1981/82	1982/83	Total
700	800	1 000	1 000	1 000	4 500

The foreign training component comes to Rs.0.5 million. Non-development expenditure (salaries of professional and supporting staff) is put at Rs.2 million. Thus the overall toal is Rs.7 million.

Integration strategy

It is essential that a boy who leaves school after matriculation/intermediate should be ready to accept social responsibility by being absorbed in our socio-economic framework as a trained, middle-class technician or worker. For this purpose, vocational and occupational subjects are being added to general education at this stage.

The expansion of science and technical education will result in the progressive integration of general and technical education in secondary schools and colleges. In the past the general tendency has been to establish separate institutions for technical education. These institutions have not always produced efficient industrial workers. The education given in them also lacked the necessary cultural content and, in practice, they catered for the rejects of the general stream and a certain stigma was attached to their programmes. The new programme will provide for progressive integration of general and technical education.

At present 60 to 70 per cent of students in secondary schools and general colleges are enrolled in arts subjects. There will be a massive shift from enrolment in arts towards enrolment in science and technical subjects; from an aimless general education to a more purposeful agro-technical education. To this end, enrolment in arts subjects will be maintained more or less at the present level while significant increases will be made in all high schools and general colleges in the provision of facilities for science and technical education. Eventually, a third of the total enrolment will be in each of the three main streams, arts, science and technical/occupational subjects. This will mean an increase in enrolment in technical subjects from the present 5 per cent to 33 per cent, and science subjects from 23 to 30 per cent by 1980.

For science teaching, 2,200 additional units at the matriculation stage and 700 units at the intermediate stage will be established. Each unit will have facilities for 80 students (40 in each class) and will consist of two classrooms and a science laboratory. The additional places for teaching science to be created during the period come to 175,000 at the higher stage and 56,000 at the intermediate stage.

Additional places will be created for technical/occupational students by establishing 3,500 additional units at the matriculation stage and 1,600 units at the intermediate stage for the teaching of these subjects. Each unit will have facilities for 80 students (40 in each class). It will consist of two classrooms and a workshop. The additional places to be provided are indicated in Table 9.

The integration of general and technical education will equip secondary and college students for gainful employment, including self-employment, in industry, agriculture, business, home economics and education in addition to providing them with a programme of general

TABLE 9. Additional places for technical/occupational students

Vocation/occupation	Places to be provided	
	Higher classes	Intermediate classes
Industrial	56	38
Business	56	36
Agriculture	56	28
Home Economics	56	28
Education	56	28
TOTAL	280	158

education. The areas of vocational/occupational studies for which facilities will be developed include electronics, auto-electricity, plumbing, household electrical appliances, dairy farming, poultry farming, vegetable farming, sericulture, crop and livestock production, shorthand, typewriting, insurance and estate broking, clearing, forwarding and shipping practices, home management, cooking and baking, first aid and home-nursing, food production and preservation, etc.

Education has been introduced as an elective subject at the matriculation, intermediate and degree levels. In this way, a major part of the vocational training of teachers is being conducted in institutions of general education.

Integration at the first stage of the secondary level

The introduction of agro-technical studies as pre-vocational studies at the middle stage (classes VI–VIII) and as the vocational component at the secondary stage (classes IX–X) began in 1972. The curricula for classes I–X were prepared and introduced in 1974. The revised curricula included agro-technical subjects in general education as a compulsory component for classes VI–VIII. A curriculum outline is given in Table 10. With a total of forty-five periods a week, nearly one-fifth of the school time is devoted to agro-technical studies at this stage.

TABLE 10. Curriculum outline. School type: secondary. Level/grade: middle classes (VI–VIII)

Subject	Periods weekly			Percentage
	Class VI	Class VII	Class VIII	
General				
Pakistan/Social studies	3	3	3	6.66
English language (technical)	6	6	6	13.33
Native language	10	10	10	22.21
Islamiyat	4	4	4	8.88
Arts	2	2	2	4.44
Physical education	3	3	3	6.66
Basic science				
Mathematics	6	5	4	13.33, 11.11, 8.88
Science	5	4	3	11.11, 8.88, 6.66
General-technical				
Agro-technical studies	6	8	10	13.33, 17.70, 22.22
Total classroom periods	45	45	45	

At the secondary stage (classes IX–X), vocational subjects are introduced. A total of nine periods a week are allocated to this subject. Agro-technical and vocational education is considered an integral part of general education and is meant to be a basic preparation for life. By providing a link between general and vocational education, agro-technical education is important in helping the individual to discover his talents and to use them in working towards a meaningful and satisfying career.

Curricula

The scheme of studies at the secondary level is reproduced in Table 11.

TABLE 11. A scheme of secondary-level studies[1]

Component subjects	Periods per week
I. *Compulsory subjects*	
1. Urdu/Bengali, two papers, 150 marks.	6
2. A modern foreign language such as English, German, French, Chinese, etc., two papers, 150 marks. (The language taken here cannot be taken in component II.)	6
3. Pakistan studies, one paper, 75 marks.	3
4. Islamiyat (Civics for non-Muslims), one paper, 75 marks.	3
II *One of two groups:*	
Science group	
1. Mathematics, one paper, 100 marks.	4
2. Physics, one paper, 100 marks.	4
3. Chemistry, one paper, 100 marks.	4
General group	
1. General mathematics, one paper, 100 marks; or household accounts and related problems (for girls not taking Home Science courses in component III).	4
2. General science, one paper, 100 marks.	4
3. One subject from the 'Y' list of subjects, one paper, 100 marks	4
III *Vocational subjects*	
1. One vocational subject from the 'Z' list of subjects. Theory and Practice, 250 marks	10
IV *Compulsory non-examination exercises*	
1. Physical Culture.	4–5
2. Socially useful manual work for inculcating a sense of the dignity of labour. Seventy-two hours in the two academic years preceding the examination.	

[1] In order to qualify for the award of the Secondary School Certificate, the candidate must pass in subjects carrying at least 900 marks.

Physical facilities

It is estimated that on average one basic comprehensive workshop and two technology workshops for each occupational area should be the minimum requirement for running industrial courses. For agricultural courses a comprehensive workshop, a technology laboratory and a model farm of at least ten acres may be the requirements. The total cost can be worked out as shown in Table 12.

For example, creating facilities in industrial fields for eighty students (one technological area) at intermediate stage will cost Rs.4.00 lacs[1] and for degree stage Rs.8.00 lacs as capital expenditure.

Staffing and recurring expenditure

The following norms may be used to estimate recurring expenditure in the shape of salaries of additional teaching and complementary staff, contingent expenditure and the consumable supplies.

For a group of eighty students in the industrial field, the additional recurring expenditure per annum will amount to Rs.40,000/- at the intermediate stage and Rs.60,000/- at the degree stage.

TABLE 12. Unit rates per student based on current norms

Vocation/occupation	Capital cost/student (rupees)	
	Intermediate stage	Degree stage
Industrial	5 000/–	10 000/–
Business	2 500/–	5 000/–
Agriculture	3 000/–	5 000/–
Home economics	2 500/–	4 000/–
Education	2 500/–	4 000/–

TABLE 13.

Vocation/occupation	Recurring cost/student per annum (rupees)	
	Intermediate stage	Degree stage
Industrial	500/–	750/–
Business	400/–	600/–
Agriculture	500/–	750/–
Home economics	300/–	600/–
Education	250/–	600/–

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1. One lac equals 100,000 rupees.

Technical teachers for a group of eighty students average five for each of the stages. Some of these teachers will hold qualifications comparable to B.Sc. Engineering or Master's degrees in the subject while some, such as the polytechnic graduates, will have diploma-level qualifications.

The supply of teachers should not pose any problem as the existing output is adequate. Short training programmes for teachers will be necessary before they are actually appointed.

Administration

These programmes can be supervised and administered at the intermediate level in the same manner as indicated for the matriculation level. As regards the degree stage, the universities, either general or professional, will be involved in prescribing syllabuses and effecting evaluations. Another alternative may be to extend the jurisdiction of the Board of Technical Education over technical programmes leading to the degree.

Standardization of workshop equipment

The National Educational Equipment Centre (NEEC) is the only institution in the country responsible for the standardization of educational equipment from primary to higher secondary levels.

The standardization of workshop tools and equipment for agrotechnical studies was also assigned to this centre.

The procedure adopted for standardization is as follows. The curriculum experts prepared lists of equipment on the basis of the curriculum. The subject experts laid down specifications for various items. Prototypes were developed in the NEEC workshop and tried out in a certain number of institutions. The prototypes were amended or improved in the light of suggestions from experts and institutions. The industrial prototypes were tried out in a number of institutions and amended or improved according to the feedback information received. In the light of these amendments or suggestions, the final design was developed. Mass production was undertaken by the appropriate manufacturers, with quality control and distribution being the responsibility of the NEEC. The standardization and procurement of equipment for agrotechnical studies was the main problem in implementing this programme.

Differences between rural and urban areas

Curricula are nationally designed and implemented. With a particular discipline, there are variations of specifics but not of generalities. For example, at primary level, the courses for social studies are similar but description of the 'locality' varies from place to place. Similarly, in rural areas, the subjects of agriculture and agricultural-based technologies are popular, while in urban areas 'industrial arts' is widely taught. In the case of local community crafts as also in home economics, the crafts, garment-making and food and nutrition courses have direct relevance to local produce, practices and customs. These subjects aim at improving the situation within the context of local traditions.

Community participation in the development of agro-technical education in schools will help in solving a number of problems. Skilled craftsmen, artisans and tradesmen from the local community can provide support to the agro-technical teachers in developing marketable skills in students of vocational courses in classes IX and X, while the local industries and trade establishment can help in providing learning experiences to students in real-life situations.

The mobilization of community resources for agro-technical education may be considered from the point of view of benefits that the school will derive from the community as also in respect of the contributions that schools can make to the development of the community.

Teachers

Training programmes

At present, one-year elementary school teachers' training courses prepare teachers for the primary and middle stages of education; a postgraduate one-year B.Ed. course is offered in the colleges of education. The institutes of education and research provide a Master's degree course in Education (one year for B.Ed.-degree holders, two years for non-B.Ed.) and a B.Ed.-degree programme of one year.

Education extension centres serve secondary-school teachers, teacher-training schools exist for principals and inspectors. These centres also assist in the modernization of education programmes and curricula and in supervising pilot secondary schools.

The departments of education also administer technical teacher-training courses after (a) the certificate level for industrial arts teachers for middle schools, for teachers of vocational schools for girls and for technical teachers for polytechnic institutes and (b) the diploma level for technical teachers for polytechnic institutes and industrial arts teachers for intermediate classes.

Institutions preparing primary school teachers are called normal schools; those institutions that prepare high school teachers are known as colleges of education and those preparing M.Ed. teachers are called institutes of education and research and are elements of the universities.

These institutions for the professional training of teachers reflect a direct relation between educational changes and the role of teachers, as

TABLE 14.

Professional courses	Basic education required
Professional technical courses (one year)	Matriculation (ten years)
Certificate in Teaching (one-year course)	Intermediate (twelve years)
Drawing Master/Arts and Crafts Teacher (one-year course)	Intermediate (twelve years)
Junior diploma in Physical Education (one-year course)	Intermediate (twelve years)
Senior diploma in Physical Education (one-year course)	BA/B.Sc.
Bachelor of Education (one-year course)	BA/B.Sc.
MA Education (two-year course)	BA/B.Sc./B.Ed.
MA Education (two-year course)	BA/B.Sc.
M.Ed. Technical (two-year course)	B.Sc./B.Com.
Ph.D./Ed.D. programme (two and a half to three years)	M.Ed. or MA(Ed.)

shown by the respective courses that generally include the following elements: modern methodology, history of education and its impact on our own education, philosophy of education, guidance and counselling, testing and measurement, sociology of education, educational psychology, child development, anthropology, and similar subjects.

The basic educational qualifications required for various teacher-training courses are shown in Table 14.

The B.Ed. curriculum has been revised by the national committee of subject experts constituted by the government for this purpose. The revised curriculum was introduced in September 1976. Innovations such as the semester system, non-vacation training of teachers and the introduction of agro-technical subjects have been recommended in the revised curriculum for the B.Ed. programme. This programme lasts three years and has been started at the Gomal University for all subjects and at the government's Science Teachers' Training College, Lahore, for science subjects only.

Postgraduate teacher-training institutes grant seven postgraduate degrees in the field of education: M A Primary Education, M.Ed. Primary Education, M A Secondary Education, M.Ed. Secondary Education, M.Ed. Business Education, M.Ed. Industrial Arts Education, and Ph.D. In Education.

The M A/M.Ed. Programme at the Institute of Education and Research University of Punjab, Lahore, offers nine areas of specialization based on modern trends and the needs of the country: Language Education, Mathematics Education, Science Education, Social Studies Education, Educational Psychology, Educational Guidance, Educational Administration, Curriculum, and Teacher Education.

At M.Ed/MA(Ed.) and at the three-year B.Sc.Ed. level, emphasis has been placed on science education. This consists of courses in pure science, including a course on environmental science; courses including discovery of laboratory techniques and a seminar dealing with the most recent problems in science education; together with fifteen courses in general education and a research project on any one of the vital areas of science education.

To meet teachers' requirements for rapid expansion of the education system, education as a subject has been introduced in secondary schools and general colleges. Students who pass matriculation, intermediate and degree examinations with education as an elective subject will qualify as elementary and secondary school teachers respectively. In order to provide a model for experimentation in the teacher education curriculum, a National College of Education has been established in Islamabad. The main function of this college is to implement the new curricula in teacher education and to play a leadership role in both pre-service and in-service education.

In-service programmes

The National Institute of Teacher Education, Islamabad, was established in 1974 at the federal level to train key education personnel in modern methods and techniques of teaching and to provide orientation in new elementary school curriculum and its effective implementation at grassroots level. Summer courses for teachers were conducted in science, mathematics, English and industrial arts in July/August 1974–76, 1978 and 1979 with the assistance of the British Council and in close collaboration with the Curriculum Wing of the Ministry of Education. The British Council provided subject experts for each course. These experts, along with their local counterparts, acquainted participants with modern techniques and innovations in teaching within the framework and objectives of the newly formulated elementary/secondary school curricula. In the areas of science and mathematics, emphasis was placed more on 'process' than 'product'. This approach represented a sharp move from the traditional 'verify and prove' teacher-centred approach towards a 'discovery type child-centred' approach in which children themselves actively participate, investigate and share the excitement of discovery.

Some training programmes were also sponsored by various international organizations such as UNICEF, Unesco, USAID, the British Council and others to enhance the professional competency of the teachers and give them a new outlook on education and the educational process.

In order to implement the new curricula effectively, teacher guides have been developed in various school subjects.

Agro-technical programme

1. With the introduction of a vocational component in the general school system, a new category of teachers must be prepared. The vocational subjects included for classes VI–VIII have been designated as agro-technical subjects and comprise the following branches: industrial education, agriculture education and home economics education.
2. For secondary schools, the vocational subjects introduced are: industrial education, agriculture education, home economics education, commercial education, and general education.
3. In order to implement the educational reforms effectively, especially the heavy component of vocational subjects, the three most important goals selected are: (a) to develop useful technical and practical knowledge; (b) to develop love of work and production; and (c) to combat prejudice against manual work through a special method of teaching known as the 'Project Approach'. Through this method students are required to complete several projects while the teacher imparts the relevant theory. The main emphasis is on 'doing' rather than on classroom teaching. This means that the teacher must give instruction in the workshops, in the field or in laboratories. The subjects remain of a pre-vocational nature. This procedure also calls for the utilization of waste materials for the production of useful items, and for the use of charts and diagrams and of audio-visual aids locally made by the teachers themselves, together with the collection of old machine parts for demonstration and similar activities so as to reduce expenses to a minimum. Thus the main role of implementation, if it is to be successful, will have to be played by the teachers. They should be specialists trained to minimize expenses as far as possible.
4. The problem of training teachers has many new dimensions and is being closely examined by the Ministry of Education. There is a great need for specialist teachers to implement the reforms. Estimates indicate that by 1980, about 20,000 teachers will be teaching agro-technical/vocational subjects in the general school system. Agro-technical teachers must be trained in such a way that they develop a sound understanding of their role and the importance of the subject. They must set an example for pupils, which means that all agro-technical/vocational teachers must be trained or retrained for the successful achievement of the agro-technical scheme of studies.
5. The teacher-training programmes launched by the Ministry are based on a national concept and, for this purpose, national agro-technical teacher-training centres have been established in each province.
   The Federal Ministry plans to allocate about Rs. One crore (US$1 million) to establish academic models to be followed by the Provincial Education Departments.

6. At present, the training of technical teachers is mainly carried out by the Provincial Education Departments. For this purpose, technical teacher-training wings are attached to the Polytechnics of Rawalpindi, Karachi, Huderabad and Peshawar. They are primarily engaged in training teachers for Polytechnics and Vocational Institutions. In addition, technical teachers are also trained at the Swedish Pak Institute of Technology, Gujrat. Women teachers for vocational institutions are being trained at Lahore.

Elementary-school teacher-education curriculum

Framing of comprehensive syllabuses. During the framing of the Professional Technical Courses (PTC) and Certificate Course (CT) (one year), the following aspects were considered by all the committees: the objectives of the course, the concepts to be covered, the detailed content of the course, the activities and experiences proposed, the equipment required, evaluation techniques, and suggested guidelines for textbook writers.

Scheme of studies. Both the PTC and CT courses will last forty-eight weeks on a non-vocational basis. There will be a minimum of thirty-three working hours in a week, equally distributed among the subjects offered during a semester. A typical week will be divided into forty-five periods of forty-five minutes each with a recess of one-half hour daily except on Thursdays. The semester system of education has been introduced.

Evaluation system. An internal system of evaluation will be applied to the theoretical papers undertaken during a semester. The final evaluation of practical teaching will be made jointly by the head of the institution or his nominee and two external examiners appointed by the principal. The PTC/CT certificates are awarded by the Provincial Education Department on the recommendation of the training institution.

Secondary-school teacher-education curriculum

Since vocational subjects have been introduced at secondary level, suitably qualified teachers to teach these subjects will be needed and the training of such teachers is therefore an immediate priority. Consequently, in the scheme of studies for the B.Ed. Course, provision has to be made to train vocational teachers through an integrated programme.

The award of the degree will entitle graduates to enrol directly in MA or M.Ed. courses. This pattern of training will have the advantage of giving students a much longer and more intensive professional training without increasing the number of years spent on academic and professional education.

It will also make the prospective teacher better equipped to facilitate learning by his pupils in particular subjects and thus more fully assume his role as a nation builder. Moreover, such a pattern will bring teacher training in Pakistan more in line with the practice in both developed and developing countries.

Curriculum for industrial-arts teachers

Industrial teachers are trained in technical teacher-training colleges, institutes of educational research and similar institutions. The training programmes in these institutions will, however, have to be modified in order to stress the skill component.

Teachers in this category will have to undergo a course of retraining for a period of at least four months in order to upgrade their proficiency in practical skills, although they will not need any pedagogic retraining. For skilled craftsmen from technical training centres, industrial training centres and vocational institutes, a training course of one year will be required. This special training will be predominantly pedagogic with a small component of practical work to prepare for the teaching profession. Polytechnic diploma-holders may be able to provide the nucleus of agro-technical teachers in high schools because of the availability of better pay scales. A special teacher-training programme of one year will be necessary for polytechnic institutes diploma-holders. This training will be predominantly pedagogic with some elements of higher skills. The skill component of the industrial teachers currently working in the middle and high schools is not of a high order, and their retraining will have to be conducted for a period of one year spread over three years. A suggested programme for such retraining is given in Table 15.

Each practical period will be of fifty minutes' duration. Thus an

TABLE 15. Proposed retraining programme for teachers

	Periods per week	Total periods	Remarks
Principles of electricity, woodwork and metalwork	3	50	The theory element of the subject will be taught along with practical activities in the workshops.
Layout of shops and organization	3	50	
Teaching methodology	1	16	
Practical work in workshops	34	544	
		660	

overall time of 550 hours (660 × 50) will be spent on training teachers in applied electricity, metal work or wood work.

It is recommended that teacher trainees should be given cohesive and intensive practical training in one discipline over a four-month period each year. This would mean that all teacher trainees would be channelled into three groups, each of which would receive training in woodwork, metalwork and applied electricity for four months in each discipline, thus completing the training period of one year spread over three years. The overall teaching time allocated to one teacher (of metalwork, woodwork and applied electricity) will come to 1,650 hours (550 × 3). Even after the completion of this cumulative period of one year's practical training the teachers should return to the institutes for refresher courses and intensive practical training for short periods so that their skills are kept up to date.

It is proposed that teacher trainees should be selected by the government and that the training programme should be in-service. The trainee may, however, be given two-thirds of his salary during training as is customary in other departments, with the full amount being paid on satisfactory completion of the training. This would also provide some incentive for the trainee to take an interest in, and to keep up with, the schedule. It is recommended that the minimum age of entry to the technical teacher-training programme should be kept at 18 years.

It is further proposed that a group of trainees with one teacher should not exceed sixteen in number.

Guidance

At present educational and vocational guidance facilities are meagre and, where available, are local in character. The National Institute of Psychology, in close collaboration with the institutes of education and research of various provinces, has been called on to devise, validate and standardize tests, inventories, training manuals and vocational information booklets for use in schools and colleges.

In the Fifth Five Year Plan, the following programme has been laid down:

1. A prerequisite for standardized tests of scholastic and special aptitude is that they should be indigenous in nature and in accordance with the ideology of Pakistan and our cultural traditions. The staff of the National Institute of Psychology will be suitably increased with regional research units for field testing and standardization of the tests and other guidance materials at national level. These units will also act as mobile units for in-service training of teachers in guidance. The National Institute of Psychology will be responsible for developing standardized aptitude tests for professional colleges and universities

to serve as entrance requirements for various professional and vocational programmes also.

2. In the first phase the National Institute of Psychology will develop cumulative cards, personality and aptitude tests, problem check-lists and vocational guidance handbooks on an all-Pakistan basis. The institute will also be responsible for developing modules of guidance for secondary students in Pakistan and these will also be employed by mobile units.
3. In the second phase four provincial guidance units of the institute will be established. These will act as mobile units for in-service training of secondary school teachers in guidance and counselling and test administration. In order to have proper guidance services, it is intended that the entire staff of the schools will be oriented to the use and outcomes of guidance services and this can be achieved only through taking the training facility to the schools rather than providing in-service training one by one as in the past.
4. One high school in each district will be helped to establish a proper guidance programme along with the placement bureau as part of its guidance services. These bureaux will provide vocational information to students and young adults on job trends, training and employment opportunities and will help young people to find employment with the assistance of local employment exchanges and employment agencies.

Integration at the second stage of the secondary level

General description

The Education Policy recommends structural changes similar to those at the elementary and high-school stages so as to provide for occupational education at the intermediate and degree levels. The concept behind this provision relates to the production of middle-level workers ('technicians'). Although the recommendations are sound in principle yet some practical difficulty is expected at these levels in achieving the objectives of technician training. According to the definition adopted by Unesco in 1962, a technician is a person working in an occuption requiring a knowledge of technology and related sciences between that of a skilled worker and that of an engineer or technologist. Occupations at technician level may call for inspection and maintenance, detailed development plans, supervision of production work, detailed construction. Collaboration with the engineer is an essential part of the work of the technician. In order to run an efficient programme of technician training at the intermediate and degree levels, much more elaborate arrangements will have to be made in terms of physical facilities and staff as compared to arrangements needed for the trade training envisaged at the matriculation stage. According to accepted norms, a fairly substantial number of workshops and laboratories are needed for technological programmes in any of the industrial fields. For example, in addition to physics and chemistry laboratories which may be available in the general colleges, others such as material testing, hydraulic and metallurgy laboratories, machine shops, woodwork shops, welding shops, applied mechanics and metrology laboratories, etc. along with the specialized staff for each discipline will be needed. It may not be possible to create all the physical facilities for running technician programmes in colleges of general education since it would be very expensive to cater for a limited group among the general body of students. Such difficulties will be more pronounced in the industrial and agricultural fields.

For the training of technicians, well-equipped institutes such as the Polytechnics already exist and these may be made solely responsible for training in industrial fields. The Agricultural University, Faisalabad, is responsible for middle-level professionals, and output has so far exceeded demand, as is also the case with the Polytechnics. It is, therefore, worth considering whether the integration of technical education at intermediate and degree levels of general education should be taken up in earnest or phased out in the later stage of the policy period. However, experimental programmes in some selected colleges can be immediately launched in the fields of commerce, home economics and education since here the requirements in respect of specialized physical facilities would be less than in the industrial and agricultural fields. Such courses as secretarial work; sales and purchasing practice; market surveys; advertising; bookkeeping; insurance, clearing, and shipping; business management; merchandizing, etc., can be introduced at the intermediate and degree stages. Similarly, courses pertaining to home economics and education can be administered without much difficulty at the two stages under discussion.

If, however, the concept of technician training in industrial fields is not adhered to, a number of courses requiring light workshops might also be considered for the intermediate and degree stages which would be more or less a continuation of the training proposed at the matriculation stage. Students who take one or two technological courses will in no way be comparable to those trained at such specialized institutions as the Polytechnics. However, such courses as those already mentioned should enable those students to develop partial proficiency in a narrow discipline. Courses that might be considered for introduction at these levels in industrial fields might include mechanical drawing, machine design, measurement and control, motor vehicle design, metalwork, electricity, electronics, architecture, air-conditioning equipment, plumbing equipment, civil engineering works, waterworks, chemical production, general civil engineering. Similarly, the agricultural field might include courses such as horticulture, stock raising, crop protection, agricultural machinery, farm management, pomiculture, floriculture, sericulture, food production, general forestry, etc.

The introduction of occupational subjects at the intermediate and degree stages will not fulfil the requirements of a full technician programme. It should, however, enable the students at these stages to have a wider area of choice in the subjects available as optional, some of which will be technological courses aimed at providing introductory knowledge in the technical fields. This, however, should increase their ability to pursue studies in specialized institutions more efficiently. For example, students passing intermediate level with technological subjects will be better prepared to pursue studies in an engineering college, and students taking up agricultural courses at intermediate level will perform better in higher studies in agricultural colleges. Apart from this aspect of preparation for higher studies, the value of such courses for occupational work will also be significant by helping to develop a genuine aptitude for a given profession. It will be necessary, therefore, to have a very flexible system of admission to specialized technical courses at the levels of general education. Finally, however, technological courses in general colleges should equip students for training as skilled workers rather than technicians until they are provided with further education in specialized colleges.

Curricula

The broad objectives of technician education may be defined as follows:

1. To create a sense of participation in, and encourage a positive contribution to, the technological development of the country.
2. To equip students to interpret the design of, and plan, production.
3. To develop an ability to identify and solve engineering/industrial problems.
4. To develop a capacity to co-relate humanistic and social knowledge so as to foster a congenial atmosphere in an organization.
5. To facilitate horizontal movement in allied industrial fields and vertical movement in specialized fields.
6. To develop leadership and supervisory qualities.
7. To induce attitudinal changes leading to an appreciation of the dignity of labour.
8. To encourage confidence in relation to self-employment.

Pattern

The engineering field offers a spectrum of occupations that vary from simple technical jobs learnt in a very short time to very complicated tasks requiring long training and experience. The ability to operate tools and machines is appropriate for skilled workers while complex and sophisticated research and design activities belong to engineers. The engineering technicians come between the skilled craftsman and the engineer, being closer, however, to the latter. The industrial technician, whose training is work-oriented, will be engaged on tasks that are nearer to those of the skilled worker than of the engineer. Thus each type of technician deals primarily with the application of established scientific and engineering knowledge and methods.

At present both types of technicians are being trained in Pakistan. The curriculum in polytechnics aims at producing 'engineering technicians' while the Swedish Pakistani Institutes and some technical training institutes aim at producing 'industrial technicians'. In both cases, the curriculum embodies basic mathematics and science courses, related technical courses, technical courses, and humanistic and social courses and it is the weightage that determines whether the course is intended for engineering technicians or industrial technicians.

With growing unemployment at the supervisory level, it is essential that the products of these institutions should have enough skills to be able to accept responsibilities at skilled-worker level with prospects of eventual movement to supervisory positions. To achieve this purpose, the curriculum should be so designed that it serves the immediate need of training skilled workers in a broader field of specialization and also ultimately producing technicians. All these aspects were given due consideration in the curriculum design.

1. In designing the new curriculum, the committees observed that in its existing form the polytechnic curriculum was too fragmented, with the result that the skill components were taught in different contexts,

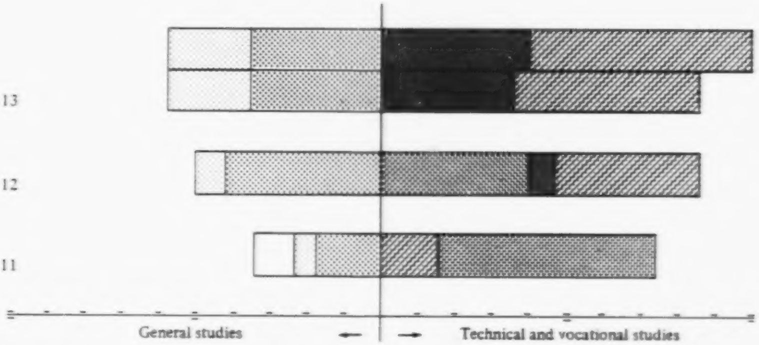

FIG. 6. Curriculum analysis, grades 11, 12 and 13. Type of school polytechnic institute. Speciality: mechanical technology. Entrance requirement: ten years of school.

whereas the Swedish pattern had a built-in continuity. An individual trained under the latter system develops the right type of skill in a particular field of specialization. An effort has been made to incorporate this aspect of the Swedish pattern in the revised curricula.

2. At present students in all technologies study a common course in the first year. In the revised curriculum, the practical first-year work will have a definite relationship to the future field of specialization.
3. The first-year practicals will cover a broad area of training according to the field of specialization (see Table 16).

TABLE 16. Training covered in first-year practicals according to specialization field

Training subject	Field of specialization	%
Mechanical technology	Machine shop	70
	General metals	15
	Welding	5
Auto diesel and farm technology	General metals	70
	Machine shop	15
	General metals	5
Refrigeration and air conditioning	General metals	75
	Welding	10
	Machine shop	5
Foundry and pattern-making technology	Foundry	45
	Woodwork	40
	General metals	5
Welding metallurgical technology	Welding	70
	General metals	15
	Machine shop	5
Electrical technology	Electrical wiring	70
	General metals	15
	Woodwork	20
Radio and television technology	General metals	10
	Wiring	70
	Woodwork	5
Civil technology	Construction	30
	Woodwook	20
	Spray painting	40
Textile technology	General metals	40
	Woodwork	20
	Electricity	20
Chemical technology	General metals, Pipe fitting and welding	30
	Electricity	15
	Laboratory techniques	40

4. A semester is of twenty weeks' duration, of which eighteen are devoted to training and instruction and the remaining two weeks to testing and evaluation.
5. The ratio of theoretical and practical courses in the first and second semesters is 10 to 90, but in no case is it less than 80 per cent for practical courses.
6. In first-year theory 5 per cent weightage has been given to related study subjects and 5 per cent to trades subjects. In the remaining semesters the ratio of theoretical and practical courses is 40 to 60, but in no case is it less than 60 per cent for practical courses.
7. Boards of technical education conduct examinations at the end of each semester in the workshop courses, while theoretical examinations may be conducted in the institutes. The workshop examinations by the board are patterned as follows: practical jobs, objective-type questions, assessment of sessional work, and orally.
8. A special summer session of ten weeks is designed to consolidate and integrate various skills acquired during regular semesters. Students are required to make saleable projects.
9. Machine shop work, drafting and designing, tool design and toolmaking technologies may be merged with mechanical technology to avoid narrow specialization resulting in limited job opportunities.

Mechanisms for adapting curricula

The government has appointed the following standing committees to prepare the courses in the light of national education policies: (a) Manpower Survey Project Supervisory Committee; (b) Project Advisory Committee; (c) Committee of Courses for: civil technology; electrical technology; mechanical technology; power groups (for automobiles and diesel, automobile and farm, power, refrigeration and air-conditioning technologies). Radio, electronics and television technologies. Chemicals technologies. Textile, weaving and spinning technology; (d) Committee for Related Studies Subjects (mathematics, natural science, social sciences and languages).

These standing committees make proposals for the curricula according to changing circumstances.

Materials and methods

The following types of material, equipment and machinery are used in these programmes: (a) workshop machinery; (b) tools and equipment, hand tools and instruments; and (c) raw materials for the project.

Most of the equipment and machinery is manufactured locally and is procured from local resources for the workshops of the institutions, although some of the more sophisticated machinery is imported.

Most of the tools and instruments are still imported although some of the simple tools are manufactured in the country. The imported instruments are procured through the World Bank, Unesco, the Ford Foundation and other international agencies.

The module system has not yet been introduced in these institutions.

Most of the raw materials are imported through local foreign exchange resources.

Physical facilities

Planning for maximum utilization

Under the new education policy it has been observed that the machinery and equipment in workshops are not utilized most of the time. The government has therefore decided to establish twenty training and production units in the country.

1. The Implementation Programme of the National Education Policy specifies that

> All the technical and vocational institutions will be encouraged to generate funds for supplementing their resources by producing saleable goods during training. Small production units will be established with technical and vocational institutes under a phased programme. Evening programmes will be introduced in technical and vocational institutes for the benefit of the community, wherever needed.... Production units would be attached in a few selected institutions on an experimental basis. For this purpose, an amount of about Rs.0.1 million per institution would be sanctioned as a revolving loan and selected items would be produced and marketed. The funds thus realized would be utilized in expanding the programme with a view to making the institutions self-financing as far as possible. Such programmes are already functioning in other countries. If this experiment shows promise, it will be gradually expanded.

2. With a view to implementing these policy directives, available facilities in the educational institutions, such as industrial equipment and tools, have been assessed. The directives can also be applied to vocational institutes.
3. The programmes at the 'Training-Cum-Production' units will not effect the normal functioning of these institutions. They will use the existing space, equipment and tools of the institutions during such hours of the day as these are not required for use by the day students. Hence the Training-Cum-Production units will mainly operate after

school hours until late evening. Students attending the regular day courses would be permitted to work in the Training-Cum-Production units for the acquisition of further skills and in order to earn the production stipend. Individuals working in factories or farms and drop-outs from the formal school system would also be able to benefit from this programme.

4. Students enrolled at the Allama Iqbal Open University for correspondence courses could not find a better source of practical training than these Training-Cum-Production units. Various course objectives as detailed in this project could be modified to suit the requirements of such students.
5. The units may subsequently accommodate all day students in the institution for practical training under 'sandwich programmes'. Ultimately these programmes could also be operated in collaboration with certain industrial units.
6. The units will work for two shifts during summer vacations to accommodate regular day students interested in receiving production-oriented training and in earning an income.

Teachers

There is no formal relationship between the general teacher-training and the technical teacher-training programmes.

Technical teacher-training programmes

The technical teacher-training programmes in Pakistan are of an in-service nature only. There are few polytechnics in the country that offer diploma courses in technical teacher-training for in-service technical teachers.

Requirements for admission to this course are: (a) diploma from any of the polytechnic institutes or an equivalent diploma from any other technical institution or polytechnic; (b) practical experience in a recognized industrial organization (teaching experience is an additional qualification); and (c) in the absence of teaching experience, preference is given to recent graduates.

The entrance examination consists of a written test and interview. The written test is of diploma standard. The result in this test, however, is not the only criterion for admission to this course. The selection of teacher trainees is also based on their aptitude, conduct, behaviour and administrative ability. The qualifying candidates must hold very high grades in theory and practical subjects besides being psychologically and physically fit and must obtain marks of at least 50 per cent.

Qualifications and status

Technical teachers employed in the polytechnics are of three categories:

1. Teachers of such related subjects as mathematics, basic sciences, social and behavioral sciences and languages. This category of teachers have the same qualifications as those in general education. They are MAs and M.Scs in the relevant subjects.
2. Teachers of the theory of engineering and work shop courses. They are qualified engineers i.e. B.E. or B.Sc. engineers in the relevant fields.
3. Teachers responsible for practical activities in the workshops. They hold polytechnic diplomas in the relevant field.

Teachers engaged in general education are mostly MAs and M.Sc.s in the relevant field.

Guidance and selection

In the implementation of the scheme, this aspect was given due attention and the polytechnic was introduced from the outset. An officer was specially deputed to contact industrial establishments. Representatives of these were invited to visit the institution while staff and students were given an opportunity to visit industrial establishments during the course period. Some places were reserved for industry nominees at polytechnics during vacations. All these efforts paid good dividends and industrial establishments offered stipends for students working in these establishments during the first vacation. Students were also encouraged to work with instructors on the assembly, maintenance and repair of machines.

These arrangements could not be maintained because of the increase in the student body and a generally unhelpful and unsympathetic attitude on the part of employers so that the institute started working in complete disassociation from industry. This situation was further accentuated with the establishment of the provincial boards of technical education as, in general, the institutions felt absolved from any responsibility in respect of the standards, training and placement of their graduates. The attitude taken was that the institutions were only responsible for implementing the courses and adhering to the standards demanded by the boards. Their only objective was to obtain the highest pass results at the board examinations and efforts to ensure the placement of graduates were half-hearted.

Serious efforts were made by the education authorities to improve the standard of training but such efforts were directed to their own sphere of activity without taking into consideration the needs of the country's economy.

This situation developed because of the fact that the educationists were handicapped by the non-availability of employment market information, inadequate manpower statistics, an absence of studies of staffing patterns, national standards of training, job analysis and job descriptions and, above all, the lack of any qualitative survey of technical institutions as recommended by the National Board of Training.

The educational authorities had to go by the development plan figures which, it seems, were computed on the general formula of 1 : 5 : 25 used in industrialized countries in respect of engineers, technicians and tradesman requirements respectively. This was also responsible for the oversupply of diploma holders and the reduction of their market value.

Examinations

Prior to the establishment of boards of technical education, the polytechnic institutes conducted their own local examination. The final assessment of the student was based on his performance in class tests, quizzes, home assignments, mid-semester and final semester tests. The students graduated through this process of testing proved very useful for industry.

With the establishment of more and more polytechnic institutes in the country, however, the government felt the necessity for a central examination system in technical education in so far as most of the newly set up institutes were deficient in building and equipment requirements. Some of the institutes did not possess qualified and experienced staff. For the purpose of having uniformity in training, the boards of technical education were established.

These boards started by conducting one examination at the end of the sixth semester only. Later on, their purview was extended to the second and fourth semesters and the following examination criteria in respect of polytechnic education were applied.

1. Marks secured in the theoretical aspects of second, fourth and sixth semester examinations conducted by the board.
2. Marks secured in the practical aspects of second, fourth and sixth semester examinations conducted by the institutions.
3. Marks secured in comprehensive practical/viva examinations at the end of the second, fourth and sixth semesters conducted by the board.

The above policy was designed to remove the inconsistency of the old system with its non-proportionate weightage of the theoretical and practical parts of the course. After operating for three years, however, this new system was found lacking in other aspects of teaching and learning requirements. Some of these are given below.

1. The system does not provide motivation to students in theoretical courses of the first, second, third and fourth semesters. In these

courses the students simply require to secure passing marks to qualify, as no incentive has been provided for securing especially good marks.

2. The poor achievement of students in the theoretical courses of the first, second, third and fourth semesters badly affects their performance in the practical parts of the courses.
3. The appointment of a large number of external examiners, for practical work in the second, fourth and sixth semesters means that the board cannot do this job independently and must consult the heads of departments. Appointment of externals, on the advice of heads of departments, is seriously damaging the very purpose of external examinations.
4. The announcement of results of first, second, third and fourth semester examinations by the institutions concerned on behalf of the board is gradually reducing the importance of the examinations in the minds of students and teachers, who now see these examinations as internal examinations.
5. Students going on to fifth and sixth semesters are of poor quality due to the defective system and at this stage it is difficult for the board to fail them in large numbers for academic, administrative and other reasons.

There is a danger that the present scheme may meet the same fate as the old scheme introduced by the former board. It is therefore necessary that an attempt is made to adopt a system free from the drawbacks of both the old and new schemes. A system is needed that will inspire the students to continuous learning and not create frustration and a sense of inferiority. Teachers of a given subject should have a say in the final assessment.

Entrance to higher education

Polytechnic diploma holders are eligible for the government Colleges of Technology. Admission requirements in the B.Tech. courses are as follows: (a) a three-year diploma from a polytechnic institute in the relevant technology; (b) two years' industrial training/experience. Candidates without industrial experience are required to undergo a year's supervised/guided practical training in industry to be arranged by the college; (c) performance in the admission test; and (d) physical fitness.

Fields of study. The technologies offered at various colleges of technologies are as shown in Table 17.

Transition between school and work

With the introduction of vocational and technical subjects in school curricula, the local community has become more involved in academic

TABLE 17.

College	Technologies	Number of seats
Government College of Technology, Rawalpindi	Electrical power	20
	Electronics and communication	20
Government College of Technology, Rasul	Civil construction highways	20
	Public health	20
Government College of Technology, Lahore	Mechanical production	20
	Refrigeration and air-conditioning	20
	Automobile and diesel technology	20
Government College of Technology, Multan	Chemical	20
TOTAL		160

activity. Recently, local councils have been elected and the task of community uplift is being planned, organized and executed at the village, Tehsil, district and divisional levels in consultation with the appropriate local bodies. At each level, the planning of developmental projects is undertaken as a co-operative venture. Thus, the educational authorities are working in close co-operation with such other departments as agriculture, social welfare, industry and the local councils, etc. This changing situation at the planning stage will help develop better relations between the school and employers.

The concept of integration of vocational and technical education with general education is of recent origin in Pakistan but has been taken up seriously and will help alter a situation in which only academic disciplines are pursued by most of the school-going population. With the introduction of pre-vocational subjects in the first stage of secondary education and vocational/technical subjects in the second stage, job opportunities have increased for young people leaving school. According to a recent survey, the agro-technical and vocational subjects at the secondary level are on the whole relevant to the needs of local industry although more dissemination of information to employers is needed so as to improve job opportunities for school-leavers.

The mechanism of occupational guidance and placement is in a formative stage and so far no results have been reported.

The B.Tech programme is geared to provide industrial on-the-job training coupled with academic instruction at the colleges of technology.

Conclusion

The integration of general education with technical and vocational education at the secondary stage has been generally accepted by educationalists and employers. Some aid from Unesco and UNDP sources was received, particularly in the field of teacher-training, but most of the funds have come from national resources.

Problems, however, arose because of the meagre resources available. Vocational subjects could not be introduced in all institutions. Teacher-training was conducted on a mass scale and the quality of the teachers so produced was not ideal. There were limited resources for evaluation of the training programmes and for follow-up studies.

In the developed countries, most professional activities are shared between the teachers' associations. In Pakistan no such organization exists to provide a forum for teachers. In the state-organized programmes, teachers have little chance of providing feedback.

There is a marked need to provide a platform for teachers of technical and vocational subjects. The National Educational Equipment Centre can offer a base in this connection, serving as a clearing-house that could liaise with the teaching community, on the one hand, and educational/industrial planners on the other. This centre could also receive and disseminate information at both the national and international levels through news-letters, reports, etc, and by organizing symposia and conferences at national and regional levels.

Spain

Ventura de Miguel Muñoz

Profile of second-level education

Structure of the system

The Spanish educational system and its reform are governed by the General Law 14/1970 on Education of 4 August 1970.

The educational system consists of the following levels: (a) pre-primary education, of a voluntary character, comprising two levels: nursery school: 2–3 years of age, and 4–5 years of age; (b) primary education, compulsory, comprising two levels: first level: 6–10 years, and second level: 11–13 years; (c) secondary education, with two distinct options: baccalaureat and University Orientatia Course (UOC) programmes: 14–16 and 16–17 years, vocational education programme: first stage:14–15 years, and second stage: 16–18 years; (d) University education: higher schools: 18–20 years, and higher technical faculties and schools: first stage: 18–20 years, second stage: 21–22 years, and third stage: doctorate.

General primary education (GPE) consists of two levels as shown in Figure 1. At the first level, emphasis is on general education; at the second level, there is a slight diversification by fields of knowledge in which vocational activities are reinforced.

Completion of general primary education leads to a *Graduado escolar* Certificate which allows entrance into secondary education leading to either the Baccalaureat or the vocational education programme. Those who have not completed their studies may repeat a course twice. A school certificate is delivered to those who do not succeed and to those who are 14 years of age and who do not wish to repeat the courses; this Certificate offers access to the vocational education programme and, to those aged 15, direct access to the world of work.

To enter a university it is necessary to follow the University Orientation Course (UOC) and to pass the selection tests established since 1974/75.

Entrance to the secondary level involves no examination. The UOC

TABLE 1.

Education level	Percentage of the total	
Primary education (GPE)		67
First level	43	
Second level	24	
Secondary education		15
Baccalaureate	10	
Vocational education	5	
Higher education		6
University schools	2	
Faculties and post-secondary schools	4	
Other studies		12

gives direct access to university schools. As in the case of post-secondary faculties and schools, it is also necessary to pass a selection competition.

Of a total of more than 8 million students, distribution by level is as shown in Table 1.

Students passing from primary to secondary level represent 87 per cent of all GPE students. The remaining 13 per cent either repeat the last course—the eighth—or abandon their studies.

At secondary level, the distribution is as follows: baccalaureat or general studies—75 per cent of all students at this level; vocational education—25 per cent of students.[1]

Administration

Secondary education, known as *enseñanza media*, comes under the responsibility of the General Directorate of Secondary Education (Enseñanzas medias). This directorate consists of three assistant-directorates, each having baccalaureat and vocational training services (see Fig. 2). All receive the same guidelines but the education offered differs, takes place in different centres and is carried out by teachers of different orientations. Inspection is carried out by different organisations.

There is an advisory body for vocational education—the 'Junta Coordinadora de Formación Profesional'—where the different ministries concerned are represented (education, labour, industry, agriculture, commerce, etc.) as well as unions, parents' and workers' organizations, enterprises, etc. Its job is to advise the Ministry of Education on new plans for studies, new educational trends and on vocational education centres.

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[1] Statistics for the school year 1976/77.

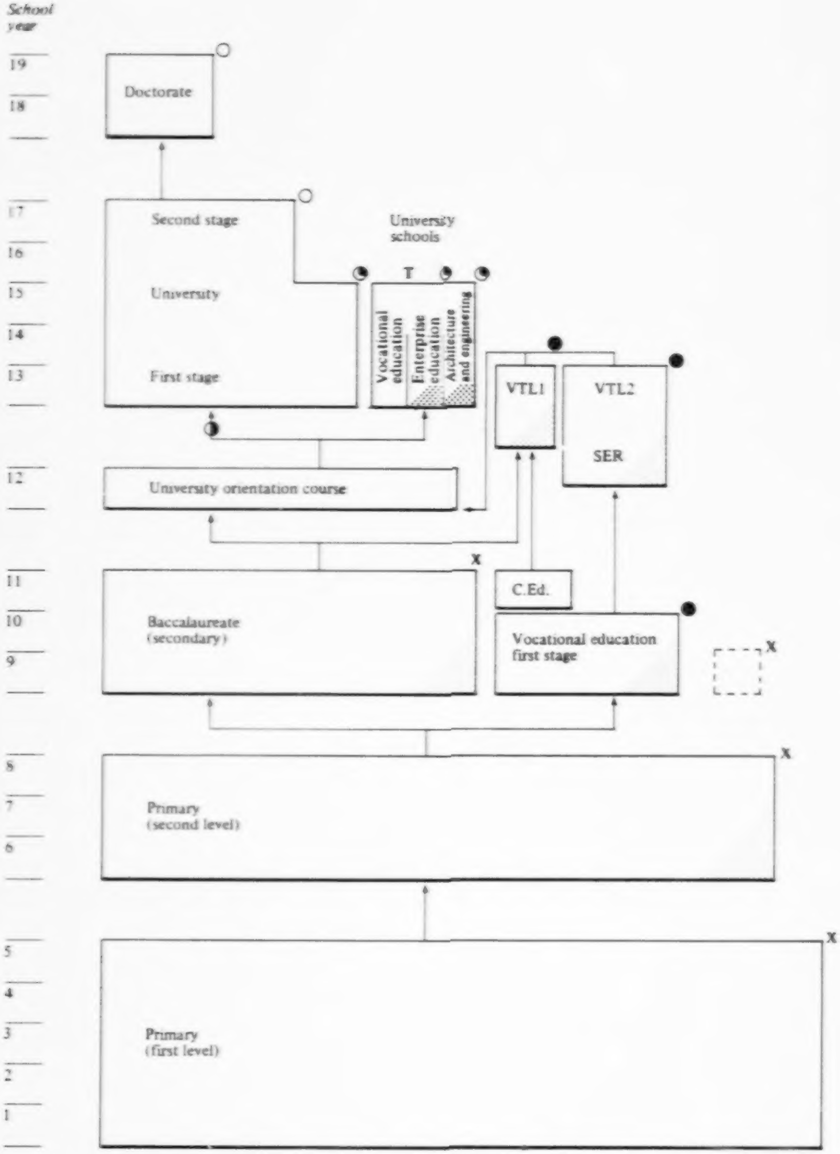
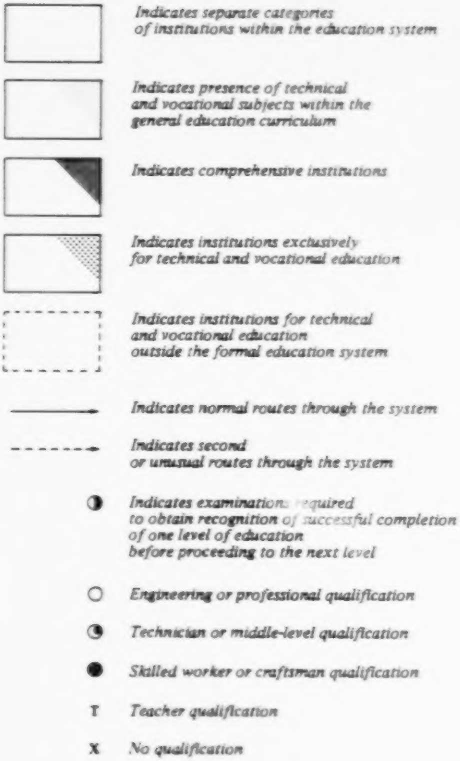

School year
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
Doctorate
Second stage
University
First stage
University schools
T
Vocational education
Enterprise education
Architecture and engineering
VTL1
VTL2
SER
University orientation course
C.Ed.
Baccalaureate (secondary)
Vocational education first stage
x
Primary (second level)
Primary (first level)

FIG. 1. Diagram of the educational system. VTL = vocational training level. SER = specialized education regime (stream). (See Key overleaf.)


Indicates separate categories of institutions within the education system
Indicates presence of technical and vocational subjects within the general education curriculum
Indicates comprehensive institutions
Indicates institutions exclusively for technical and vocational education
Indicates institutions for technical and vocational education outside the formal education system
Indicates normal routes through the system
Indicates second or unusual routes through the system
Indicates examinations required to obtain recognition of successful completion of one level of education before proceeding to the next level
Engineering or professional qualification
Technician or middle-level qualification
Skilled worker or craftsman qualification
T Teacher qualification
X No qualification

Key to Figure 1

Co-ordination between the Ministry of Education and the Ministry of Labour (labour policy) is carried out on an informal basis.

In 1978, the budget accorded to the Ministry of Education represented 17.27 per cent of the general state budget. For the same year, 5.2 per cent of the total allotted to the Ministry of Education was accorded to the General Directorate of Secondary Education.

Policy of secondary education: its formulation and trends

Underlying philosophy

The 1970 General Law on Education established the following educational objectives: access to education for all; complementing general

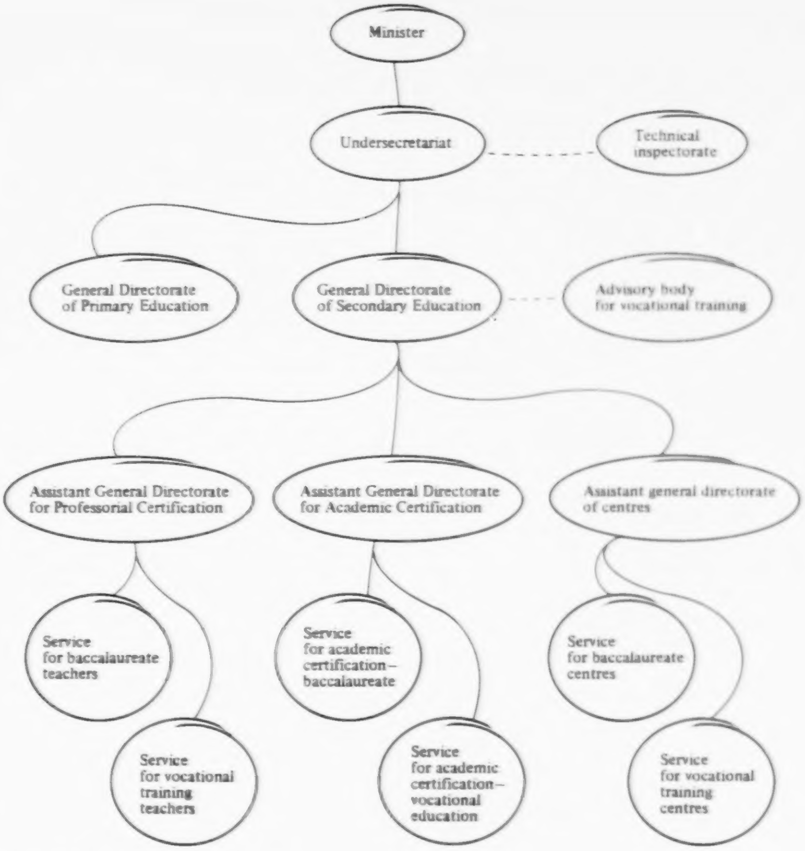

Minister
Undersecretariat
Technical inspectorate
General Directorate of Primary Education
General Directorate of Secondary Education
Advisory body for vocational training
Assistant General Directorate for Professorial Certification
Assistant General Directorate for Academic Certification
Assistant general directorate of centres
Service for baccalaureate teachers
Service for vocational training teachers
Service for academic certification – baccalaureate
Service for academic certification – vocational education
Service for baccalaureate centres
Service for vocational training centres

FIG. 2. Ministry of Education

education with vocational education to better equip individuals in their working life; provision of the same educational possibilities to all with no restriction other than scholastic capacity; establishment of a coherent educational system, through unity, flexibility and interrelation and, at the same time, provision of a wide range of possibilities for lifelong education, taking into account needs imposed by the country's economic and social evolution. What in fact is involved is the construction of a lifelong education system, not conceived on the basis of selection of students and permitting maximum development of the capacities of each and every Spaniard.

Among the educational goals cited are: 'integral human education, the harmonious development of the personality and preparation for the responsible use of liberty'; 'acquisition of study and work habits and capacities to exercise professional activities that permit broadening of the social, cultural, scientific and economic development of the country'.

The educational policy adopted for secondary level is specified in two articles. Article 21.1 of the Law, covering the Baccalaureat, states:

> The Baccalaureat, which constitutes the level which continues General Primary Education, besides furthering the human education of students, seeks to intensify their education in order to prepare them for access to higher studies or for Vocational Education at the Second Stage and for active life at the heart of society.

With regard to vocational education, Article 40.1 stipulates that:

> Vocational education's specific goal will be to supply students with an adequate capacity to exercise their chosen profession and also to continue to give them an integral education. It will seek to keep, in its organization and output, a close relationship with the structure and the forecasts of the world of employment.

Article 41.1 establishes that vocational education will inform students in specific techniques of their chosen profession while taking into consideration the social order and the various enterprises and labour unions in the world of work.

Changes and prospects

The General Law on Education of 1970 was designed to establish compulsory general education until the age of 14. Preceding application of this law, common studies lasted only until 10 years of age, becoming more diversified later on, with the option of continuing primary studies until 14 years of age or of entering the baccalaureat programme after having successfully passed an entrance examination.

The new General Law on Education assumes different planning according to educational levels: primary and secondary in its two aspects of the baccalaureate and vocational training. In a general aspect (this is discussed in detail later), the changes introduced are the following:

Four years of study (ages 10–13) have been added to primary education and will be taught by teachers of primary education in primary education centres. The goal is the diffusion of an integral training for all in a spirit of equality, adapted, wherever possible, to the aptitudes and capacities of each student. A new subject has been added—Introduction to Technology—in which students are grounded in technical knowledge and skills.

The baccalaureate has been reduced to three years and a subsequent

University Orientation Course. Its objective is to continue the humanistic formation of students and also to intensify their preparation for higher studies. A new subject—Technical Vocational Education and Activities—gives students the possibility of applying their theoretical knowledge and facilitating their vocational orientation.

Vocational education has as its objective the forming of students for the exercise of their chosen profession while, at the same time, continuing the development of their integral education. Subjects of a formative character that were introduced into vocational education signify an innovation compared to the former educational systems of apprenticeship and industrial training, which sought to train industrial workers and foremen and give them the necessary capacity to integrate themselves into industry. The new Vocational Education Programme deals not only with the industrial sector but also with the agricultural sector and its services.

For the last two years, the sectors concerned have shown interest in having compulsory education prolonged to the age of 16. At present, the Ministry of Education is undertaking consultations on secondary education through which it hopes to show the need for integration of various types of education affecting students of the baccalaureat and of vocational education at the first stage. This integration would concern young people of 14 to 16 years and instruction would be compulsory and free of charge. Starting at this level, two routes appear: the baccalaureat (upper-secondary education with several open technical options), which prepares students for higher education, and technical education proper, designed to train middle-level technicians. For those who do not wish to continue their studies or who leave the educational process at a given moment, different entries into the world of work have been established.

Major issues

Economic needs

The present system, which permits a choice of studies, does not offer real mechanisms for articulation between the educational system and the economic needs of the country. As a result, unemployment, high in all sectors, is becoming more pronounced in certain specialities, academic or vocational.

Social aspects:

1. The Ministry of Labour provides a series of vocational courses that train young people for easy access to the world of work. The same ministry, especially conscious of youth unemployment, also offers a

series of advantages (exoneration from taxes, etc.) to facilitate young people's entry into enterprises.

2. It is possible to resume studies through evening courses covering the vocational education, baccalaureat and university programmes. Non-formal education courses are also organized by the Ministry of Labour.
3. It may be observed that there has been no change in attitude concerning the value of educational certificates. They are still important in terms of access to employment, particularly for high-level social and economic jobs.

Democratization

The possibilities of access to education, at all levels, are increasing, but studies carried out show that students having access to universities often belong to the upper economic levels. Evening courses facilitate study for people in active employment.

Primary education and vocational education at the first stage are free of cost. On the other hand, the baccalaureat and vocational education at the second stage are not, nor are studies at university level; a moderate enrolment fee is required in the state centres. Scholarships and grants from the state also exist, through the Patronato para el Fomento del Principio de Igualdad de Oportunidades (Foundation for the Support of the Principal of Equality of Opportunity). This financial aid is allocated as follows: 39 per cent to primary education, 18 per cent to baccalaureat, 16 per cent to vocational education, 24 per cent to university education and 3 per cent to other types of education.

The traditional system of examinations was replaced by a system of continuing evaluation at primary and secondary levels, and a system of recuperation has been included for students who fail to receive a positive evaluation. This system functions in spite of certain difficulties.

Integration strategy

Since the application of the Law on Education, pilot centres have been created for the testing of new means of education and, in particular, new methodologies. These centres function at present with difficulty.

With a view to planning the new reform which is to be undertaken, the ministry has developed a survey on the '*Integración de las Enseñanzas Medias*' (secondary), which will be submitted to the public for a general evaluation.

Integration at the first stage of secondary education

Students of 12 to 15 years are divided between two levels, with three options, as shown in Table 1.

1. From 11 to 13, students follow primary studies that are common at second level, but, there is a 'slight diversification by fields of knowledge and a reinforcement of vocational activities in order to facilitate the student's subsequent study and work options' (Article 15.2). Table 1 shows that the subject 'pre-technology' has been included in the planning of studies; this implies the primary intention of establishing a relationship between general education and technology in the education system.
2. From the age of 14, with the title of *Graduado escolar*, students may commence the baccalaureate programme. These studies last three years, from 14 to 16 (Table 3). Their objectives are indicated on page 248. At this level, in addition to general and optional subjects, students can follow the subject 'Theoretical-vocational Activity', which covers agricultural, industrial and commercial, fishing and nautical, administrative, artistic and other sectors. The centres should offer at least two specialities and students pick one of them. This activity only exists in the second and third years for two hours a week. This subject, of a technological nature, is included in the general secondary curriculum. Its introduction into education, due to administrative difficulties, has not given the expected results.
3. Vocational education is made up of two stages: the first stage (Table 4) and the second (Table 5). The first stage (14–15 years) is open to those holding the title of *Graduado escolar* or having a scholastic certificate. The aim at this level is to orient students' personal aptitudes without as yet giving them a work speciality, while continuing their integral education. To this effect, the relationship between formative and scientific subjects and technical and practical subjects is 50 per cent each. The second stage tends toward specialization, as can be seen in the study plan, and students may enter it after completing the first stage and having followed a supplementary course, or after completing the first cycle of secondary education. Its duration is of two years (16–18 years).

The studies under this system are those of the 'general stream'. The same types of education may follow the 'stream of specialized education' (Table 6).

These types of education—baccalaureate and vocational education—come under the responsibility of the General Directorate of Secondary Education of the Ministry of Education. They are not compulsory and there is no pre-selection procedure for entrance, except that corresponding to entrance into the first cycle of the baccalaureate.

Curricula

The subjects within the various educational curricula are compulsory (Tables 2–7). All students—girls and boys—receive the same education.

A plan of equivalencies has been established for the baccalaureate and for vocational education which affects only subjects in general education.

Education material utilized in the baccalaureate programme is that normally used for general studies—science laboratories, audio-visual aids, etc. For vocational education, workshops exist that are equipped for practical work with appropriate machines and materials.

Manufacture of equipment for use outside the centre is prohibited in the workshops. Collaboration sometimes exists with outside parties for maintenance activities.

With regard to secondary education, no significant differences exist between rural and urban education situations.

Teachers

The quality of teachers is guaranteed by the academic certification required in different branches: letters, sciences, technology and practical experience. Since 1970, pedagogical training has been the responsibility of the institutes of educational sciences, which have as their task the training and the further training of teachers. These institutes give 300 hours of pedagogical aptitude courses—theoretical and practical.

The institutes function in an irregular fashion, generally due to administrative problems. At present, an inquiry is being made with a view to creating teacher-training schools.

The certificates delivered to teachers of the baccalaureat and of vocational education are different and, in general, not equivalent.

Curricula for the training of general and vocational teachers are relatively close, except in certain very specialized areas, and equivalence may exist in accordance with decisions taken by the institutes.

The CAP courses claim to have the following goals: preparation of teachers for administrative techniques, planning, evaluation and methodology; knowledge of didactic resources and their application; in-service training of teachers through closed-circuit television; general knowledge of psychology relating to the learning process and, in general, other subjects related to the functioning and the organization of the educational centres.

Other in-service courses for teachers exist on educational methods, specific themes of a pedagogical nature and managerial functions.

Teachers of the baccalaureate programme may be qualified at one of two levels: titular or assistant. For both levels, certificate requirements are the same—a university teaching licence. The economic situation of the titular teacher is slightly better than that of the assistant.

Vocational-education teachers may teach theoretical and practical subjects. A university degree is required of theoretical teachers; in the centres, teachers in the fields of science and technology are qualified engineers.

Practical work is given by industrial teachers who acquire their certificates in vocational schools.

The economic situation of the theoretical teacher is the same as that of the assistant, or slightly inferior to that of the titular. The workshop teacher has an inferior economic position.

Guidance and selection

No established guidance projects exist for teachers although the institutes of educational sciences propose courses for the directors and on teaching methods for the various subjects.

Promotion from one year to the next takes place if all subjects have been successfully completed. Nevertheless, it is possible to begin a new year even if two subjects have not been passed on the understanding that they are passed during the year.

Reform

We have already mentioned the reform at present under consideration with the object of making the final stage of primary education compulsory until 16 years of age.

Integration at the second stage of the secondary level

This stage is not divided into two levels. Depending on the age of the student, it includes students of the University Orientation Course and students of vocational education at the second stage.

Curricula

The following refers in particular to UOC and vocational education at the second stage.

University Orientation Course

Certain subjects are compulsory for all students (Table 7), such as foreign language, philosophy and Spanish language. In the sciences, mathematics and physics are required subjects and in letters, literature and contemporary history. There are also optional subjects.

The course is given in the baccalaureate centres and is followed by 30 per cent of all students matriculating in the baccalaureate programme. This figure would be increased if students repeating a year were included. The ratio of girls to boys is 50 : 50.

Vocational education

To pursue these studies, the acquisition of cultural and scientific knowledge related to that of the baccalaureate is necessary. This basic knowledge allows 80 per cent of the two-year curriculum to be devoted to technical and vocational studies and only 20 per cent to general subjects.

Cultural and scientific knowledge can be acquired through the baccalaureate and in this case it is necessary to enter the first year of the second stage directly (year 12).

Students from the first stage may acquire this knowledge while following the Complementary Education Course for access to the second stage (Tables 5 and 6) or by studying the subjects of this course at the same time as the technical and vocational courses of the second stage curriculum; in this case, attendance is prolonged from two to three years. This, in effect, is the system called the 'Stream of Specialized Education' (Regimen de Enseñanzas Especializadas) (Table 6). If we consider the total as three years, the percentage destined for scientific and cultural knowledge is approximately 50 per cent. These studies permit students to continue at higher levels if they so desire.

Of the total number of students following the vocational education studies, 35 per cent belong to the second stage, boys representing 23 per cent and girls, 12 per cent.

Level of programmes

The level of programmes in technical education, drawing, technologies and practice corresponds in general to technician-level technical and vocational education.

The level of cultural and scientific subjects in vocational education, since it is the same as that in higher secondary education, permits access of students to higher academic studies.

All subjects are compulsory and the level is the same for those wishing to enter the world of work as for those who continue their studies.

Curricula and percentages at this level will be found in Tables 5 and 6.

TABLE 2. Curriculum outline. Education: primary, second level. Level/grade: primary. Section: 6-7-8.

Subject group	Subject	Periods weekly										
		First year			Second year			Third year				
		Class.	Lab.	Workshop	Class.	Laboratory	Workshop	Class.	Laboratory	Workshop	Total	%
General	Social sciences										8	
	Spanish language										14	
	Foreign language										11	
	Physical education										7	
	Plastics and music										5	65
Science	Mathematics										11	
	Science										7	23
Technical	Pre-technology										5	6
	Religion										5	6
Total classroom periods												
Total laboratory periods												
Total workshop periods												
Total practice												
Grand total per week											75	100

No mechanisms, in the strict sense of the term, exist for the adaptation of curricula to changes imposed by society. However, it may be observed that in vocational training at the second stage new specialities are being integrated due to social requirements.

There are no special work-study programmes within scholastic education. However, evening courses allow actively employed students to follow secondary-level education.

TABLE 3. Curriculum outline. Education: Baccalaureate. Level/grade: secondary. Section: 9-10-11.

Subject group	Subject	Periods weekly										
		First year			Second year			Third year				
		Class	Laboratory	Workshop	Class	Laboratory	Workshop	Class	Laboratory	Workshop	Total	%
General	Social sciences	6			5			6			17	
	Spanish language	5			5			4			14	
	Foreign language	5			7			3			15	
	Physical education	2			2			2			6	
	Philosophy							4			4	64
Science	Mathematics	5			4			4			13	
	Physics and chemistry				5			4*			5&4	
	Natural sciences	5						4*			5&4	30
Technical	Drawing	3									3	
	Technology											
	Workshop—practice											
	TVEA				2						2	6
Total classroom periods		31			30			27				
Total laboratory periods												
Total workshop periods												
Total practice												
Grand total per week			31			30			27		88	100

*Optional

Methods and materials

Teachers from centres for vocational education are available to carry out vocational education at secondary level, as described on page 255.

No such innovations as self-learning packages, module systems, etc., exist. However, equivalency examinations have been established for those who have two or more years of work experience; success in these tests gives access to a first-stage certificate.

Workshops are utilized only for education in the schools, and efforts are made to apply time schedules for their use corresponding to the best interests of studies.

Table 4. Curriculum outline. Education: vocational education—first stage. Level grade secondary. Section: 9-10.

Subject Group	Subject	Periods weekly										
		First year			Second year			Third year				
		Class	Laboratory	Workshop	Technical	Loratory	Workshop	Technical	Laboratory	Workshop	Total	%
General	Spanish language	2			2						4	
	Foreign language	1			2						3	
	Civics	4			4						8	
	Physical education	2			2						4	32
Science	Mathematics	2			2						4	
	Physics and chemistry	2			2						4	
	Natural sciences	1			1						2	17
Technical	Drawing	3			3						6	
	Technology	3			3						6	
	Practice—workshop			9			9				18	51
Total classroom periods		20			21							
Total laboratory periods												
Total workshop periods				9			9					
Total practice												
Grand total per week			29			30					59	100

There are no differences between the rural and urban zones in terms of content and implementation of curricula. For certain rural areas, however, a system of alternation between work in the country and in the educational centre is authorized.

Teachers

With regard to vocational education at the second stage, the level being the same as secondary schooling and the education being given in the same centres and by the same teachers as in the stage previously described, information given on page 255 applies here.

Teachers of technical education and practice in the workshops of the vocational education centres often work in industry, teaching in their free hours in the afternoons and evenings; more and more, however, a ten-

TABLE 5. Curriculum outline. Education: vocational education—second stage. Level/grade: general stream secondary. Section: 11-12-13.

Subject group	Subject	Periods weekly										
		Access			First year			Second year				
		Class.	Lab.	Wsh.	Class.	Lab.	Wsh.	Class.	Lab.	Wsh.		%
General	Social sciences	5			1			2			8	
	Spanish language	5									5	
	Foreign language	4			3			3			10	
	Physical education	1			2			2			5	33
Science	Mathematics	5									5	
	Physics and chemistry	5									5	
	Natural sciences	3									3	15
Technical	Drawing				5			5			10	
	Technology				5			5			10	
	Practice—workshop						12			9	21	47
	Enterprise organization				1			1			2	
	Safety and hygiene				1			1			2	5
Total classroom periods		28			18			19				
Total laboratory periods												
Total workshop periods							12			9		
Total practice												
Grand total per week			28			30			28		86	100

dency to devote themselves exclusively to the centres may be observed, with all the advantages and disadvantages that this entails.

At secondary level, two inspectorate bodies exist—one for the baccalaureat and one for vocational education. Their task consists of supervising the proper functioning of the centres and of the education provided, of advising teachers on pedagogical questions and of carrying out a series of administrative duties that permit the efficient functioning of this educational level.

TABLE 6. Curriculum outline. Education: vocational education—second stage 'specialized education stream'. Level/grade, secondary. Section: 11-12-13.

Subject group	Subject	Periods weekly										
		First year			Second year			Third year				
		Class.	Lab.	Workshop	Class.	Lab.	Workshop	Class.	Lab.	Workshop	Total	%
General	Spanish language	2			2			1			5	
	Foreign language	2			2			2			6	
	Civics	1			3			3			7	
	Physical education	2			2			2			6	27
Science	Mathematics	3			2			2			7	
	Physics and chemistry	3			2						5	
	Natural sciences							3			3	16
Technical	Drawing	3			3			3			9	
	Technology	4			4			3			11	
	Practice—workshop			9			9			8	26	51
	Enterprise organization				1			2			3	
	Safety and hygiene	1						1			2	6
Total classroom periods		21			21			22				
Total laboratory periods												
Total workshop periods				9			9			8		
Total practice												
Grand total per week			30			30			30		90	100

Guidance and selection

No educational or occupational guidance is offered at this level. As mentioned above, promotion from one year to the next takes place if all subjects have been successfully completed. Nevertheless, it is possible to begin a new year even if two subjects have not been passed, on the understanding that they are passed during the year.

TABLE 7. Curriculum outline. Education: University Orientation Course (UOC). Level/grade: access to university. Section: 12.

Subject group	Subject	Periods weekly					
		Course					
		Obligatory	Option A	Option B	Optative	Total	%
General	Contemporary world history		4				
	Art history				4(A)		
	Spanish language	3	4				
	Foreign language	3					
	Physical education						
	Philosophy	3					
Science	Mathematics			4			
	Physics			4			
	Chemistry				4(B)		
	Natural sciences				8(B)		
Technical	Technical drawing				4(B)		
	Technology						
	Practice						
	Classical languages:						
	Latin				4(A)		
	Greek				4(A)		
Total classroom periods							
Total laboratory periods							
Total workshop periods							
Total practice							
Grand total per week							

(A) Option—letters
(B) Option—sciences

To enter a university without having completed the University Orientation Course given in the baccalaureat centres, it is necessary to pass an examination given in the University centres. Entrance into university schools does not require admission tests.

From vocational education at the second stage and onwards, students may enter a university school directly, in the same speciality, without an entrance examination.

Students' work experience is evaluated without this signifying promotion, although those who possess work experience of more than two years may take the examinations referred to on page 258 which facilitate the obtainment of academic certification.

Transition between school and work

There are no specific measures to facilitate the transition from school to work. However, we may note the existence of evening courses for vocational education which attract numerous workers wishing to improve their situation, and courses of a vocational nature organized by the Ministry of Labour.

Conclusion

Integration of studies in vocational education took place during the 1960s and 1970s; at present, only two sets of students taking the vocational education programme at the secondary stage have completed their studies, and it is therefore difficult to make an evaluation on this basis. In view of the somewhat unsatisfactory results obtained, however, new solutions are being sought, such as integration of general or baccalaureat studies with those of vocational education at the first stage for students of 14 to 16 years.

No close relationship between educational and employment policies yet exists. Success can be noted, however, in respect of steps taken by the Ministry of Labour to accept certificates delivered in vocational education.

Spain is fully conscious of its future integration in the European Economic Community and is anxious to establish a closer relationship with other European countries. For these reasons, our country would like to have at its disposal facts on other educational systems, curricula, technical terminology, etc., particularly in countries belonging to the Common Market. It would also like to have available similar information from various situations such as the socialist, American and Japanese systems, for purposes of comparison.

It would be interesting to learn of new experiments being carried out in certain countries in technical and vocational education, its integration into general education, results of methods and materials utilized, etc.

Dissemination of information is the responsibility of the Assistant General Directorate of International Co-operation. In particular, the Subdirección General de Ordenación Académica de Enseñanzas Medias is directly involved in this regard (see Fig. 2). One of its functions is the study and introduction of methodological innovations. The Inspectorate collaborates in this dissemination, given its close relationship with the centres and the teaching profession.

United States of America

Theodore Buila

Introduction

Two reference points are offered as a preface to this study. The first deals with the structural diversity within the American educational system, a situation that cautions, yet permits, generalizations. The second deals with educational terminology, problems of definition common to American education as well as internationally.

Education in the United States is a local affair in each of the states and United States territories. Approximately 16,200 autonomous school districts administer a combined total of over 88,000 public elementary and secondary schools. To this number must be added approximately 18,000 private elementary-secondary schools and 12,000 post-secondary institutions (two-thirds of which are in the private sector). Virtually all instructional/administrative decisions are made locally—not at the state or federal level: administrative organization, curriculum, graduation requirements, text selection and school financing. To the traditional educational system must be added the non-traditional youth and manpower training programmes of the Department of Labor (over one-half of the 3 million participants in 1978 were under 21 years of age). Separate programmes for American Indians (Department of Interior) and for delinquent minors in state/local correctional facilities add still another degree of diversity.

There are two immediate definitional problems that continue to plague educators.

The first deals with defining when general and practical skills courses become vocational education: categorical definitions appear to be more for administrative convenience (e.g. funding and administrative boundary maintenance) than for the real world. Some vocational education definitions find no problem with grade level or length of instruction. Industrial arts, career guidance, home-making, one-semester typing or auto-mechanics courses are considered vocational. In some states algebra, trigonometry and English are considered vocational courses when taken by vocational students. In many states, instruction is considered vocational only when it has paid employment as a stated programme objective.

The second definitional problem deals with instruction offered in non-traditional secondary educational settings. The first situation relates to the growing number of manpower and youth training programmes serving school drop-outs. Instruction and curriculum content is at the secondary level. Instruction is provided 'outside' the traditional school setting: in manpower training centres, by employers, and in private schools. Most programmes offer a basic educational component stressing the completion of a high school certificate/diploma through general education development tests (GED). A second situation involves the rapid movement 'upward' of secondary-level vocational-technical curricula into post-secondary institutions. Reliable comparisons of vocational education by school level and programme graduates (manpower reserves by school level) are becoming blurred. This issue will be dealt with later in the present study.

This case-study contains, although under no specific heading, several educational channels with which most educational systems analysts are unfamiliar because of their orthodox orientations. Each of the channels involves curriculum integration and access to a community's total learning resources.

Over 75 per cent of all grade 12 students are employed part time, with one-half enrolled in vocational education courses occupying more than fifteen hours per week. Virtually all of the employment is student-initiated and unsupervised by school staff.

All public secondary and post-secondary schools have one or more vocational advisory committees. Additionally, many schools have formal citizen advisory committees at work on educational issues including: school disegregation, competency testing and special education. It is virtually impossible to document the extent of informal or shadow advisory committees that provide continuing assistance to vocational instructors in areas such as job placements and in securing shop material/equipment beyond the financial means of the local school budget.

Team sports, band and chorus groups, student government, student clubs ranging from science and language clubs to national vocational clubs such as the Future Homemakers of America, are common to most secondary schools. In both instances, group activities capitalize on natural student interest in group 'fun experiences' so as to strengthen student self-concept/expression, reinforce learning, and provide an opportunity for friends to teach friends—stressing leadership development. The out-of-school listing includes boy and girl scout troops, 4-H Clubs, and various religious youth groups. Over two-thirds of the secondary students participate in one or more of the student organizations/activities listed.

Structure of American education

Perhaps the best way to start a description of American education, and, in particular, the detailing of secondary-level instruction, is to look at the system through the eyes of a secondary-level student. In structural terms this is what the student might normally expect to encounter as he progresses through the system.

Virtually all (over 98 per cent) of his elementary school colleagues will have entered grade 9 of a four-year comprehensive secondary school. The chances are good (about 75 per cent) that he will graduate from secondary school with a diploma.

When he graduates, the chances are one in two that he will enrol in a thirteenth year of school at either a local community or junior college, a university, or a private trade or technical school.

When he looks back at his secondary school classmates, he will see that about 40 per cent of them selected a college preparatory mix of courses and 25 per cent selected a vocational mix—the remaining 35 per cent having picked out a general mix of subjects.

It is probable (one out of two chances) that those of his classmates who did not complete secondary school will earn their diploma or a GED secondary equivaliency certificate by the time they reach 25 years of age. They will have accomplished this 'on their own', through a government youth employment training programme, in conjunction with military service, or through a programme offered by an employer.

Once our student goes to work, he can expect a period of supervised on-the-job training provided by his employer. Depending on the employer and occupation, he can also expect varying amounts of formal instruction provided by his employer. And as new equipment processes are introduced, these, too, will be accompanied by in-service instruction.

Participation in employer-sponsored educational activities will be: required (safety, company orientation, new equipment/technology) and voluntary (apprenticeship programmes and advanced skill training).

The student's continuing education will in most cases be employer-specific, that is, completion certificates will probably not be recognized by other employers. Work experience and union status will have transfer value, probably close to 100 per cent.

Should the student wish to enter or continue formal higher education leading to a degree, he will probably be able to locate a nearby university that will recognize his work experience/company training and award him from one to three years of university credit.

Looking back on his career of work, he will no doubt feel that there was outside pressure from his employer or a licensing agency to participate in employer-sponsored continuing education activities or to continue formal study for a higher degree, such pressure being in the form of job promotions, salary increases, and licence renewals.

Formal system: institutions and control

The United States possesses not one but two extremely diverse and robust educational systems: a traditional institutional or formal system and a continuing or in-service system existing outside the formal system. Figure 1 depicts both systems graphically.

The formal education system is comprised of over 116,000 schools as detailed in Table 1. By level, the system is made up of elementary schools (generally eight years), a mixture of junior high school—senior high school combinations (e.g. 6-3-3, 6-2-4), comprehensive high schools (including a small percentage of area vocational schools, about 5 per cent). The system is capped by a mix of post-secondary institutions (one to four years) that includes the university. Table 1 shows school numbers and enrolment data by level of education.

The system is decentralized. Elementary and secondary schools, other than private schools, are operated by locally elected school boards.

TABLE 1. Number of educational institutions and local administrative units by type of control and instructional level: United States, 1976–78[1]

School level	Type of control		
	Public	Private	Total
Local school districts (elementary-secondary levels)	16 271		16 271
Elementary schools:	62 644	14 200	76 844
Middle schools (grades 5/6–8)	4 180		
Combined elementary-secondary	1 521		
One-teacher schools	1 111		
Secondary schools:	23 857	3 800	27 657
Senior high (grades 9/10–12)	11 658		
Junior high (grades 7–10)	7 434		
Area vocational centers	1 248		
Post-secondary schools:	2 458	9 127	11 585
Non-degree, one to three years	990	7 509	8 499
Junior/community colleges, two years	916	235	1 151
Colleges/universities, four + years	552	1 383	1 935

1. Not included in the elementary and secondary school numbers are 1,524 special schools for the handicapped. Area vocational center school numbers are based on sample survey estimated data contained in the Woodruff study cited in sources. Post-secondary non-degree institutional data should be regarded as minimum. National school listings, while considerable, still remain incomplete.

Sources: National Center for Educational Statistics, *Digest of Educational Statistics 1979; Statistics of Public Elementary and Secondary Day Schools, 1977–78 (Final); Post-Secondary Schools with Occupational Programs, 1978 Directory*; Woodruff, Allan, et al., *National Study of Vocational Education Systems and Facilities*, Vol II, 1978.

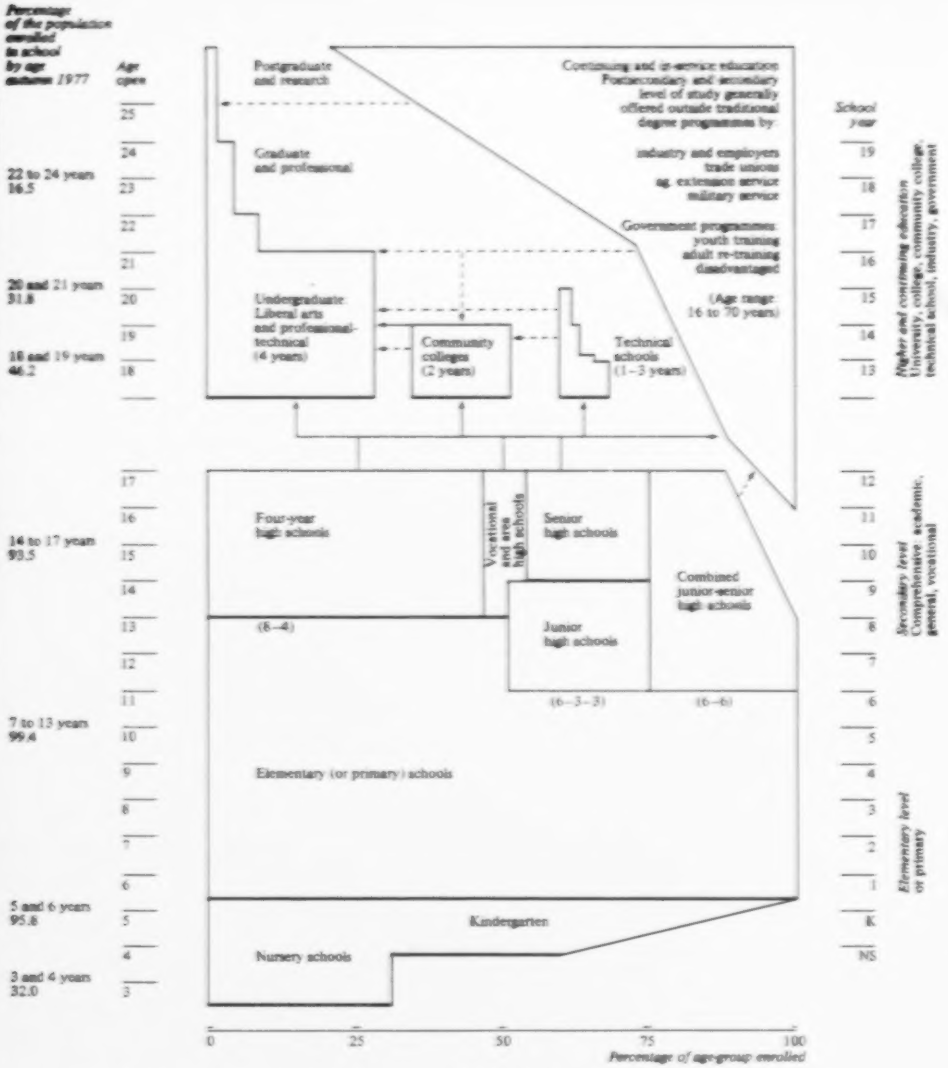

Percentage of the population enrolled in school by age autumn 1977
Age open
22 to 24 years 16.5
20 and 21 years 31.8
18 and 19 years 46.2
14 to 17 years 93.5
7 to 13 years 99.4
5 and 6 years 95.8
3 and 4 years 32.0
25
24
23
22
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
Postgraduate and research
Graduate and professional
Undergraduate: Liberal arts and professional-technical (4 years)
Community colleges (2 years)
Technical schools (1–3 years)
Continuing and in-service education
Postsecondary and secondary level of study generally offered outside traditional degree programmes by:
industry and employers
trade unions
ag. extension service
military service
Government programmes:
youth training
adult re-training
disadvantaged
(Age range: 16 to 70 years)
Four-year high schools
Vocational and area high schools
Senior high schools
Combined junior-senior high schools
Junior high schools
(8–4)
(6–3–3)
(6–6)
Elementary (or primary) schools
Kindergarten
Nursery schools
School year
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
K
NS
Higher and continuing education
University, college, community college, technical school, industry, government
Secondary level
Comprehensive: academic, general, vocational
Elementary level or primary
0
25
50
75
100
Percentage of age-group enrolled

FIG. 1. The structure of education in the United States.

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Whereas 80 per cent of the elementary and secondary schools are publicly controlled, 80 per cent of the post-secondary institutions are privately controlled (although two-thirds of post-secondary enrolment was in public institutions). It should be noted that almost 80 per cent of the non-degree private schools (about 5,900 out of 7,509) were proprietary institutions in business to make a profit for their owners.

Student progress through the formal system

Matriculation through the elementary and secondary levels is generally based on successful completion of course work at each grade level. Not infrequently students are 'held back' for a specific course for an entire year. Statistics (1976) show that, on average, 11.2 per cent of the 17-year-olds enrolled in school (about grade 12) were enrolled below their modal (expected) grade level.[1] Matriculation examinations are not utilized in the United States.

Entry into post-secondary institutions is open—that is, there are any number of alternatives open to the student to satisfy a school's admission requirements. This 'open admissions policy' is perhaps best demonstrated in the case of adult members of a community who make up over one-half the enrolment in most junior/community colleges. Previous grades, diplomas, age, etc., are of little or no importance for enrolment in community colleges.

No skill qualification certificates are issued upon graduation at any level. States vary in their licensing requirements for various occupations, with most occupations not requiring licensing/certification. Professional occupations (e.g. medicine, law, teaching) are most frequently certified or licensed. Craft or trade-union 'cards' are generally portable, i.e. valid in all states.

Continuing system: structure and scope

The continuing or in-service education system (CE) is composed of full and part-time instruction provided by employers, trade unions and government agencies or initiated by individuals, i.e. self-study. The continuing educational system has existed in varying forms since the beginning of history. It probably represents education in its most natural form. Entering the 1980s the question no longer seems one of equal status recognition for CE, but of how best to maximize the instructional resources of both systems in forging an integrated system of lifelong learning.

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1. Bureau of the Census, *Population Characteristics: Relative Progress of Children in School: 1976. Series P–20, No. 237*, Washington, D.C., April 1979.

The focus of cosntinuing education is generally technical and occupationally specific. The level of instruction varies considerably. For example, industry programmes (e.g. IBM, Westinghouse, United Technologies) focus on new technology and at a depth simply not available in most universities.

Instructional formats range from long-term apprenticeship training (three to six years) and fifty-week manpower training to one-week seminars, evening presentations, visitations, and individual consultations. The general pattern of instruction involves the organization/industry providing its own staff and facilities. Only nominal use is made of formal educational facilities.

While participation rates in continuing education activities are difficult if not impossible to reconstruct from existing statistics, there is little doubt that, in the course of a lifetime, in the case of vocational-technical education (measured in hours of training or participation rates), CE activities dwarf the formal system by at least a magnitude of ten. Two public sector examples, for which recent data are available (representing only a tip of the CE iceberg), serve to demonstrate this point:

1. In 1978, Department of Labor youth and manpower training programmes administered under the Comprehensive Employment and Training Act (CETA) enrolled 3.3 million persons, of whom 1.17 million were enrolled in vocational classroom education or combination classroom-work experience programmes (48.8 per cent of students enrolled under the CETA were under 22 years of age).[1]
2. In 1979, over 18,000 Department of Agriculture extension advisers provided adult and youth education programmes to rural and urban areas in every (3,100) county in the United States. The 4-H Club programme (rural/urban youth approximately 10–18 years of age) had 5.5 million active members in 1979 and over 500,000 volunteer adult club advisers.[2]

Profile of second-level education

Enrolment

School attendance in the United States is compulsory between 6 or 7 and 16 years of age. The exceptions concern only a small fraction of the student population. For example, most states have provisions allowing

[1] United States Department of Labor, *Employment and Training Report of the President*, pp. 364–9, Washington, D.C., 1979.

[2] Jerald L. Rose, 'Designing 4-H With People,' *County Agents Directory, 1979*, Skokie, Ill. Century Communications, 1979, p. 14; and Gale Research, *The Encyclopedia of Associations, 1980* (item 3044), Detroit, Mich, 1980, p. 254.

students to leave school if they are employed and have completed grade 8. Similarly, most states have provisions whereby a child can be educated at home—in effect, to grow up without formal elementary and/or secondary school.

Figure 1 details the three levels of education in the United States. Close to 100 per cent of the 14 and 15-year-old group are enrolled in school (98.4 per cent in the autumn of 1978). This is the age when most students matriculate from elementary to secondary school. At 16–17 years of age, the enrolment percentage drops to 89.1 per cent with little difference between the sexes noted as regards retention rates. Secondary school (formal) graduation rates have been relatively stable since the 1960s at about 75 per cent of the school-age population. Of the 25 per cent of students not formally graduating/completing secondary school, about one-half will earn their 'diploma' by successfully passing a General Equivalency Development (GED) examination during their 20s—thus bringing the high school graduate percentage for those under 29 years of age to approximately 87 per cent. The 2,670 GED centres tested over 640,000 persons in 1978 with a 59 per cent passing rate. Their average age was 25.5 years and they had compiled an average of 9.9 years of formal school.[1] Secondary school retention/graduate rates vary considerably between states/school systems. For example, the October 1979 *Dropout Report*, published by the New York City Board of Education, estimates that 45 per cent of its grade 9 students (approximately 40,000) will not complete secondary school.

Curricula

The comprehensive character of the secondary school curriculum is best demonstrated in the range of course offerings and the individualization of study programmes by students. In the most recent 'complete' national survey (8,489 of approximately 23,000 public secondary schools in 1972/73) over 2,100 course titles were reported. (These were 'reduced' to 429 academic and 53 occupational programme titles.) The largest schools, 1,500 or more students, offered all the courses while the smallest schools offered 350. Student/teacher ratios vary considerably, particularly in vocational education programmes (ten to twenty-five students per class). The 1978 secondary school average was 13.8 students per teacher.

Course requirements for graduation are set by local schools and are uniform for all students attending the school. Typically, they occupy one-third to one-half of the course hours during secondary school: English three to four years, social studies two to three years, mathematics one to two years, science one to two years, and physical education one to four years. Students elect their remaining courses. (Approximately half of the states have established course minimums for secondary school within the ranges listed.)

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[1] American Council on Education, *The GED Statistical Report, 1978*, Washington, D.C., 1979, 16 pp.

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The elective nature of the curriculum-course selection process yields a high degree of variation in course-mixes, making it difficult to generalize on the specific purpose of a student's programme. While the old programme classifications of academic, general, vocational are largely still intact, they tend to tell us more about those educational/occupational options which today's student wants to keep 'open' than they do about the educational content of work.

Accurate statistics concerning secondary school enrolments by programme type are, at best, approximations. Problems with definitions are further compounded by differing opinions among administrators and students on programme classification. In perhaps the best single national profile of secondary school students, the National Longitudinal Survey initiated in 1972—covering over 16,000 students—43 per cent of the students classified themselves as enrolled in college preparatory or academic programmes, 33 per cent in general programmes; and 24 per cent in vocational programmes of study. A comparison of students by programme reveals sharp differences in social class between academic and vocational students.

1. More girls tend to be enrolled in vocational programmes than boys.
2. More rural than urban students are enrolled in vocational studies—in the more affluent suburbs, the figure was twice as high.
3. The parents of vocational students have considerably lower incomes than those of academic students.
4. Vocational students tend to score considerably lower on ability tests (one-half to one standard deviation) than academic students.
5. Proportionally, more vocational students than academic students belong to minority groups.

Administration

The local school and school district are the heart of the United States system of secondary education. State and federal units of government act primarily to assist local educational authorities in their mission. Local autonomy remains a fact of educational life in 1980.

Secondary education is served by a complex network of organizations ranging from formal governmental units to informal public citizen interest groups. These organizations function almost always outside the local school in terms of direct administrative power. Typically the relationships are advisory (by legislative mandate or voluntary) or contractual.

State and local variation in the governance and implementation of public education is, without a doubt, at its all time peak in the United States. Organizationally, American education will not stand still. Adult students have brought about a mingling of the formal and continuing education systems with degree and non-degree study, gaining university credit for work experience, and co-operative research activities.

Federal government

Constitutionally, the federal government has no delegated power in the area of education. The direct result of this action has been the establish-

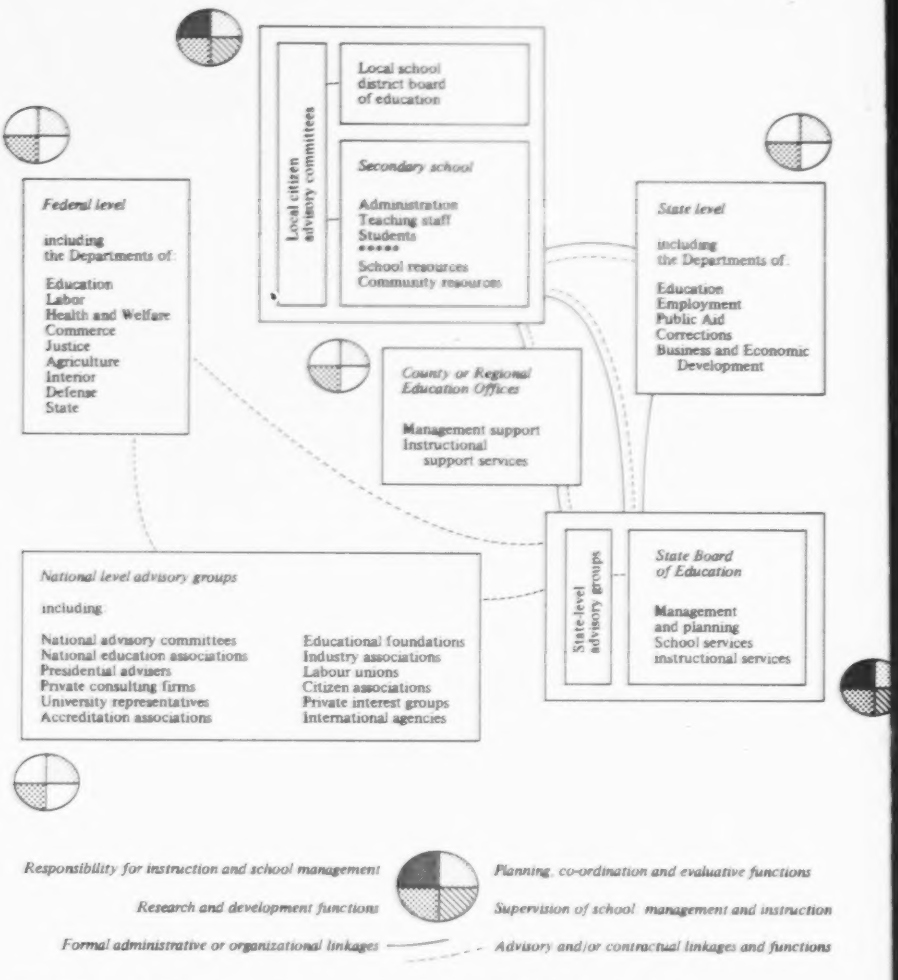
Local citizen advisory committees
Local school district board of education
Secondary school
Administration
Teaching staff
Students
School resources
Community resources
Federal level
including the Departments of:
Education
Labor
Health and Welfare
Commerce
Justice
Agriculture
Interior
Defense
State
State level
including the Departments of:
Education
Employment
Public Aid
Corrections
Business and Economic Development
County or Regional Education Offices
Management support
Instructional support services
National level advisory groups
including:
National advisory committees
National education associations
Presidential advisers
Private consulting firms
University representatives
Accreditation associations
Educational foundations
Industry associations
Labour unions
Citizen associations
Private interest groups
International agencies
State-level advisory groups
State Board of Education
Management and planning
School services
Instructional services
Responsibility for instruction and school management
Planning, co-ordination and evaluative functions
Research and development functions
Supervision of school management and instruction
Formal administrative or organizational linkages
Advisory and/or contractual linkages and functions

FIG. 2. The administrative structure of education in the United States.

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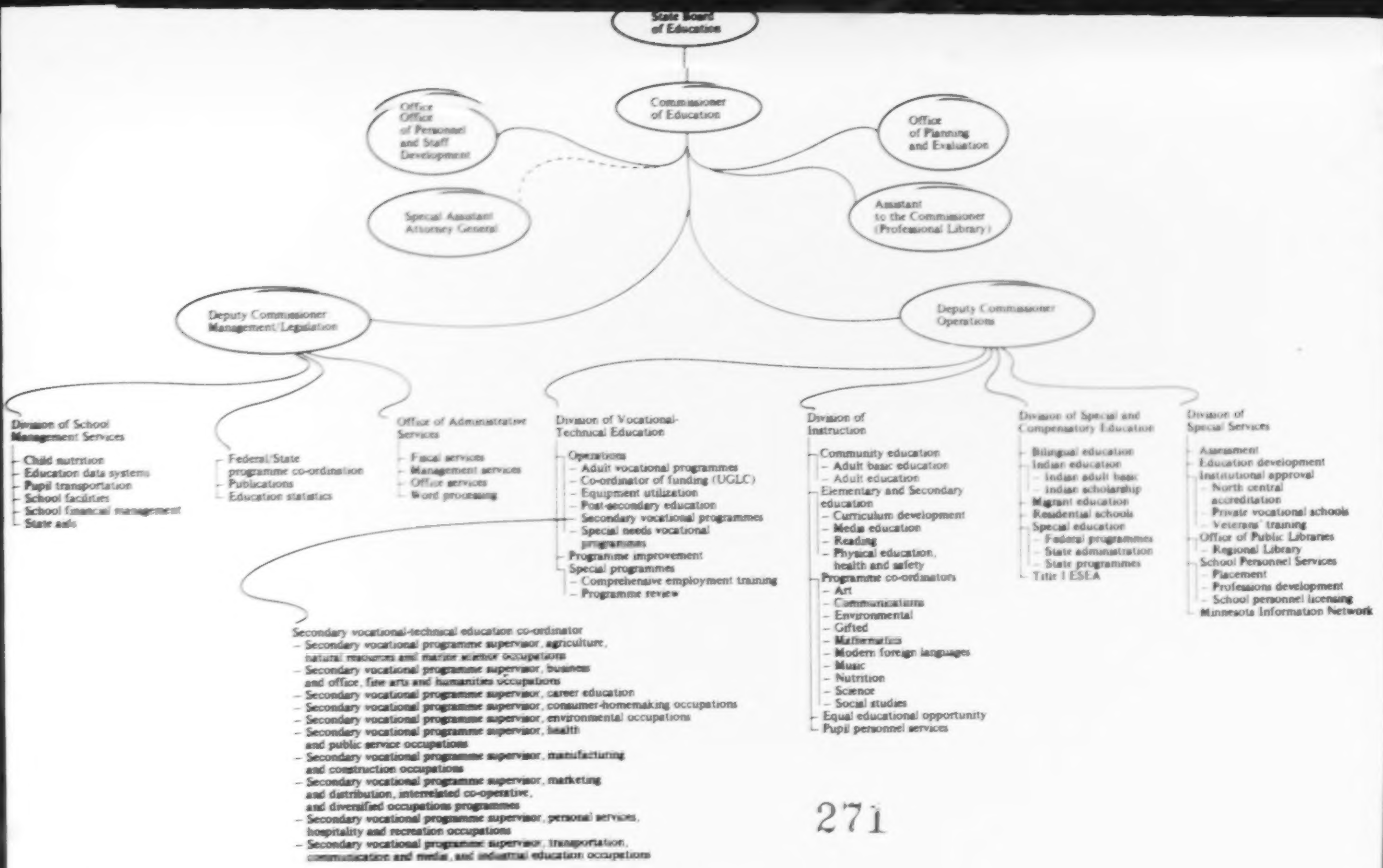
State Board of Education
Commissioner of Education
Office Office of Personnel and Staff Development
Office of Planning and Evaluation
Special Assistant Attorney General
Assistant to the Commissioner (Professional Library)
Deputy Commissioner Management/Legislation
Deputy Commissioner Operations
Division of School Management Services
- Child nutrition
- Education data systems
- Pupil transportation
- School facilities
- School financial management
- State aids
- Federal/State programme co-ordination
- Publications
- Education statistics
Office of Administrative Services
- Fiscal services
- Management services
- Office services
- Word processing
Division of Vocational-Technical Education
Operations
- Adult vocational programmes
- Co-ordinator of funding (UGLC)
- Equipment utilization
- Post-secondary education
- Secondary vocational programmes
- Special needs vocational programmes
Programme improvement
Special programmes
- Comprehensive employment training
- Programme review
Division of Instruction
Community education
- Adult basic education
- Adult education
Elementary and Secondary education
- Curriculum development
- Media education
- Reading
- Physical education, health and safety
Programme co-ordinators
- Art
- Communications
- Environmental
- Gifted
- Mathematics
- Modern foreign languages
- Music
- Nutrition
- Science
- Social studies
Equal educational opportunity
Pupil personnel services
Division of Special and Compensatory Education
- Bilingual education
- Indian education
- Indian adult basic
- Indian scholarship
- Migrant education
- Residential schools
- Special education
- Federal programmes
- State administration
- State programmes
- Title I ESEA
Division of Special Services
- Assessment
- Education development
- Institutional approval
- North central accreditation
- Private vocational schools
- Veterans' training
- Office of Public Libraries
- Regional Library
- School Personnel Services
- Placement
- Professions development
- School personnel licensing
- Minnesota Information Network
Secondary vocational-technical education co-ordinator
- Secondary vocational programme supervisor, agriculture, natural resources and marine science occupations
- Secondary vocational programme supervisor, business and office, fine arts and humanities occupations
- Secondary vocational programme supervisor, career education
- Secondary vocational programme supervisor, consumer-homemaking occupations
- Secondary vocational programme supervisor, environmental occupations
- Secondary vocational programme supervisor, health and public service occupations
- Secondary vocational programme supervisor, manufacturing and construction occupations
- Secondary vocational programme supervisor, marketing and distribution, interrelated co-operative, and diversified occupations programmes
- Secondary vocational programme supervisor, personal services, hospitality and recreation occupations
- Secondary vocational programme supervisor, transportation, communication and media, and industrial education occupations

FIG. 3. Organizational diagram of the Minnesota Department of Education, with detail for secondary vocational education.

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ment and maintenance of a decentralized system of public elementary and secondary education. Having said this, however, it can hardly be denied that the federal government has a long history of enabling-type participation in education: the Land Ordinances that set aside one-thirty-sixth of all new land for public education in the late 1700s and 1800s, money and land for schools for the handicapped in the 1820–30s, manual training education for Indian tribes in the 1850s, the land grant college system in the 1860s, rural extension education in the 1910s. This is mentioned because, in principle, most American citizens have historically opposed any expansion of the federal government in education. *The major impact of the federal government in American education has and continues to be in the area of achieving social justice, i.e. working towards the goal of equal public educational opportunities for all citizens.*

Historically, the federal government has played a relatively minor role in secondary education. On the surface the situation appears unchanged. The federal government's share of local school revenue is less than 10 per cent. However, the educational prerogatives of state and local secondary education authorities are being challenged by a rapid increase in federal educational/training programmes. Each of the categorial grants includes new federal administrative contractual provisions and each touches the instructional process to some degree.

Financial situation

Public elementary and secondary schools in the United States receive 99.5 per cent of their revenue from government sources—a total of $81,000 million in 1977/78. Local governments continue to provide the major source (48 per cent), although the range between states is considerable: New Hampshire receiving 85 per cent and New Mexico schools only 17 per cent from local sources. In most recent years the state and federal government share has been steadily increasing (see Table 2).

TABLE 2.

Year	Total expenditure per student ($)	School revenue (percentage distribution)		
		Local	State	Federal
1929/30	108	82.7	16.9	0.4
1949/50	259	57.3	39.8	2.9
1969/70	955	52.1	39.9	8.0
1976/77	1 953[1]	47.8	43.4	8.8

1. 1977/78 estimate. *Source:* National Center for Educational Statistics, *Education in the United States: Statistical Highlights Through 1977–78.*

An accurate comparison of cost figures between secondary vocational and non-vocational students is complicated by the comprehensive character of American secondary schools. Accounting procedures do not segregate students by programme category. The average per-pupil expenditure was $1,953 in 1977/78. However, there was a wide variation between states (e.g. Alaska $3,890, Mississippi $1,225, and Puerto Rico $687 in 1976/77). Comparative analysis is further complicated by the fact that accounting procedures vary between schools, e.g. amortization costs, depreciation schedules, and programme operations formulas: class/course pupil-teacher ratios. School administrator 'rule of thumb' cost index ratios offer perhaps the most meaningful comparisons.

Policy of secondary education: its formulation and trends

Underlying philosophy

The United States has no official educational policy beyond the belief in education implied in the 'general welfare' provision of the Tenth Amendment. As already noted, the democratic character of the nation's educational system is welded to local control which prevents, by Constitutional design, a national school policy. The closest thing the United States has to a national policy for secondary education is a series of consensus-type 'educational rights' that most of the American public consider inviolate.

Equality of opportunity as regards school access for all pupils—rural or urban, black or white, handicapped or normal, male or female.

Equity in school curriculum—diverse offerings in each school: general and vocational courses.

Local school control—schools to be shaped by, be sensitive to and responsive to local community needs.

Individual choice for students in terms of access to all programmes; and for parents in being free to educate their children in other than public schools.

Anyone studying American secondary education must be impressed by the curriculum choice afforded to pupils. At the same time, however, the equal opportunity educational legislation of the 1970s serves as a reminder that even the most basic of educational rights are still in a state of evolution for some classes of students.

The fact is that the American comprehensive secondary school of the 1970s and 1980s continues to track students by ability to the point where even common or core classes are not always shared by all students.

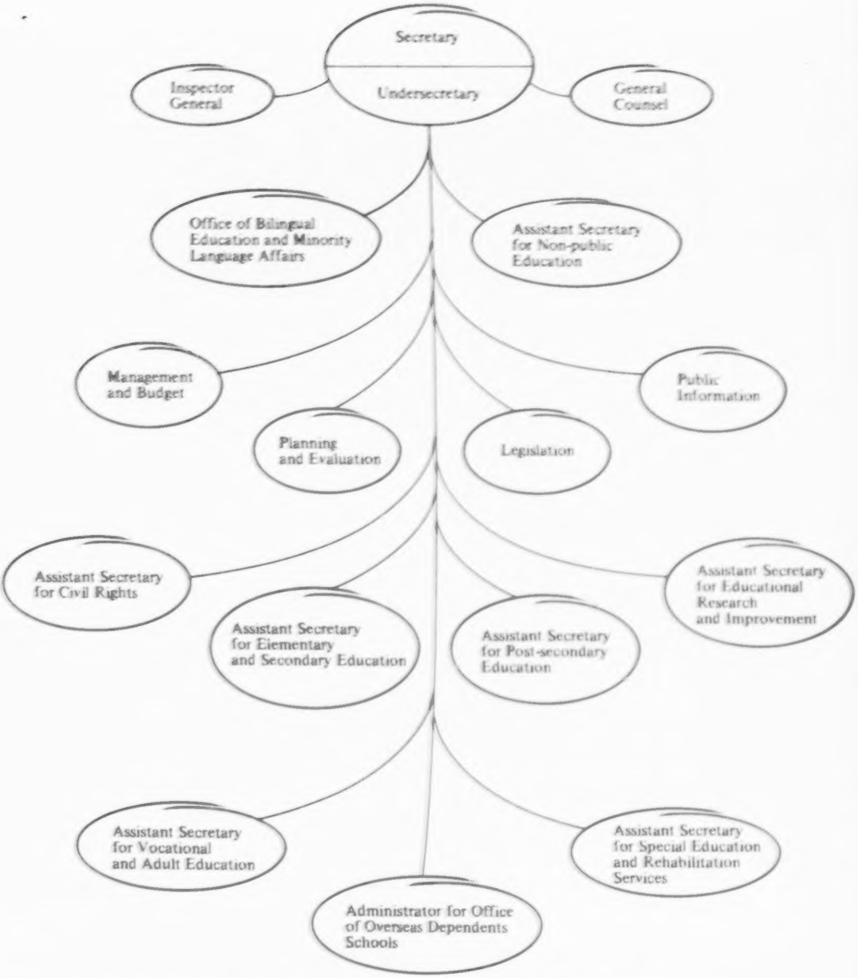
Secretary
Undersecretary
Inspector General
General Counsel
Office of Bilingual Education and Minority Language Affairs
Assistant Secretary for Non-public Education
Management and Budget
Public Information
Planning and Evaluation
Legislation
Assistant Secretary for Civil Rights
Assistant Secretary for Educational Research and Improvement
Assistant Secretary for Elementary and Secondary Education
Assistant Secretary for Post-secondary Education
Assistant Secretary for Vocational and Adult Education
Assistant Secretary for Special Education and Rehabilitation Services
Administrator for Office of Overseas Dependents Schools

FIG. 4. Organizational diagram of the United States Office of Education.

Vocational students are significantly poorer in both socio-economic status and ability than academic curriculum students. (It is quite possible that the emergence of the Area Secondary Vocational school in the 1960s and 1970s as a new form of comprehensive secondary school is the formal crystallization of a dual secondary school system in the United States.)

Occasionally, the great educational secondary school debate deals with the question of what education should do to encourage self-fulfilment. The general view is that as the United States reaches towards a post-industrial society, the education of *Homo cognito* cannot deny the technology nor the experiences of *Homo industrialis*.

> We live in a society which honors poor philosophy because philosophy is an honorable calling, and ignores good plumbing because plumbing is a humble occupation. Under such practices, we will have neither good philosophy nor good plumbing. Neither our pipes nor our theories will hold water. [John W. Gardner, *Excellence: Can We Be Equal and Excellent Too?* p. 56.]

> The utilitarian skills and techniques of each generation are soon outmoded. The search for wisdom and virtue never is. Not all the technological triumphs of history have satisfied man's need for these, nor displaced or even approached them as the most inspiring and fruitful of all subjects of human conversation. [A. Whitney Griswold, *Liberal Education and the Democratic Ideal*, p. 80.]

When questioned on the apparent paradox between the doctrine of equality and current school practice of grouping students, most educators choose not to respond to the paradox but to the implied accusation that they and/or the school system have induced inequities. Their position is a dialectical form of subject-matter Darwinism. They state that the school is neutral; schools only serve to accommodate the natural segregation of students that subject-matter precipitates. The effects of instructional method are not generally acknowledged. In any case, educators acknowledge the problems of providing a solid and meaningful educational programme for youth with low academic abilities. Vocational education is one answer.

Certainly the enactment of an extraordinary range of federal educational legislation in the late 1960s and 1970s concentrated on socially disadvantaged groups is evidence that the public had knowledge of, and was ready to respond to, the educational inequities encountered by minority groups.

Secondary-educational process components

So far we have detailed a composite of American education. Perhaps most important, we have attempted to alert the reader to the dynamic character of secondary-level education as it increasingly strains at the traditional traces of methods and institution. We have also endeavoured to stress the American belief that education is a shared responsibility: student, family, community and government. The next section of the paper focuses on some of the more critical formal secondary system components to facilitate systems comparisons: schools, curriculum instructional methods and resources, rural-urban location effect, teaching cadres and school-work linkages.

School types

The comprehensive high school is a generic term that can be used to describe American secondary schools. As mentioned earlier, virtually all secondary schools offer a mixture of general and vocational courses and the trend is for more schools to offer sequential instruction (generally two or more years) in a broad range of occupational areas. Tables 3, 4 and 5 show over 6,000 schools (25 per cent of all secondary schools) offering five or more vocational programmes.

The area secondary vocational school and traditional technical high school respectively represent a new and an old variation on the dominant comprehensive high school. Area secondary vocational schools or centres (approximately 1,250) are regional secondary schools that serve several feeder schools within a single school district or on a multi-district basis in urban and rural locations. Occupational programme offerings are varied—twenty-five different programmes not being uncommon, with some schools offering over fifty occupational programmes. Instruction varies from one to four years with two years being commonest.

Students will either transfer to the area secondary vocational school (ASVS) on a full-time basis for instruction or attend on a shared-time basis—with general course work and student activities provided at the student's home school. ASVS attendance is voluntary (by student choice). ASVS guidance staff will normally visit local secondary schools several times a year to counsel prospective students. Upon graduation, both ASVS and technical high school students receive the standard secondary school diploma. Special work qualification certification is not issued—although many trade unions will award advanced apprenticeship standing to ASVS and technical high school graduates.

Almost all major cities have one or more traditional technical high schools (established in the early 1900s) with a reputation for technical-vocational study. Frequently the technical high school serves the centre-city as an area secondary vocational school. Attendance at these schools is generally on a full-time basis. Academic course work has a reputation for being relatively rigorous. Instruction in the ASVS and technical high schools is aimed at job entry on graduation, although many of the technical high schools are preferred by students planning to continue their higher education in the sciences. It should be noted that the number of area secondary vocational schools is increasing (the result of school district consolidation and federal aid) while the number of technical high schools has remained fairly constant during the past twenty years.

Curriculum offerings

In all states, local school districts must offer a curriculum within guidelines prescribed by the State Board of Education. This being said, how-

Table 3. A selective institutional profile of American vocational education: elementary and secondary, 1978

School level	Approximate number of providing institutions	Programme comments
Elementary schools (middle grades 7–8)	All	Some combination of course work in career exploration or guidance, industrial practical arts or home economics. Provided as separate courses or integrated grade courses.
Secondary schools (grades 9–12)		
Regular or comprehensive public schools	24 000	Offer one or more sequential vocational programmes, one to four years in length, most frequently in the fields of business, home economics and industrial courses and/or personal skills courses offered on a one to two-semester basis.
Regular or comprehensive public schools (included in the 24,000 figure)	4 875	Offer five or more sequential vocational programmes one to four years in length at a single school location.
Area vocational schools	1 250	Shared-time schools providing full and/or part time vocational instruction to students from feeder high schools. Multiple vocational offerings, frequently in excess of twenty-five per school, generally two to three years in length.
Specialized vocational schools	225	Specialized full time schools for vocational introduction. Programmes include both academic and vocational course work. Schools may specialize in a single area such as commerce or trade.

Sources: National Center for Educational Statistics, *Digest of Educational Statistics 1979*; *Statistics of Public Elementary and Secondary Day Schools, 1977–78 (Final)*; *Directory of Secondary Schools with Occupational Curriculums, Public-Nonpublic, 1971*; *Post-Secondary Schools with Occupational Programmes, 1978 Directory*. Allan Woodruff, et al., *National Study of Vocational Education Systems and Facilities, Vol. II, 1978*; United States Department of Labor and the U.S. Department of Health, Education, and Welfare, 'Employment and Training Report of the President', unpublished data.

TABLE 4. A selective institutional profile of American vocational education: post-secondary, 1978

School level	Number of institutions control:		Programme comments
	Public	Private	
Post-secondary			
Vocational/Technical	506	112	There are over 9,000 private and public post-secondary schools. Many of them suggest advanced levels of instruction although many also offer instruction that in content and level is commonly found in secondary schools. The reasons for this include: (a) secondary graduates-drop-outs not previously enrolled in vocational programmes either by choice or non-availability, (b) change of occupational plans, (c) shared-time programmes, i.e. dual enrolment in secondary and post-secondary school. International comparisons of American programme graduates at the post-secondary school level can be misleading due to mixed instructional levels.
Technical institute	122	113	
Junior/Community college	788	201	
University/College	254	241	
Business/Commercial	4	1 297	
Cosmetology/Barber	0	2 163	
Flight school	5	1 059	
Hospital school	147	770	
Allied health	114	245	
Arts/design	0	254	
Trade school	14	736	
Other	1	191	
Total institutions	1 955	7 382	
Enrolment	712 150	991 805	

Sources: See Table 3.

TABLE 5. A selective institutional profile of American vocational education: Secondary-post-secondary and apprenticeship training, 1978

Level and programme	Number of participants in 1978	Programme comments
Secondary-post-secondary (Department of Labor and Federal Government programmes)		Youth employment and training programmes are emerging as a secondary-level form of education. These non-traditional programmes are generally aimed at youth 16–21 years of ages, many of whom are secondary school drop-outs.
Job corps	49 000	Seventy-four residential centres; 48 per cent 17 or younger; 86 per cent school drop-outs; strong trade training component.
Youth incentive entitlement pilot projects	29 700	Job guaranteed to keep socio-economically disadvantaged students in school or bring them back to earn a secondary school diploma.
Youth employment training programmes	125 000	Sixty projects, 300 sites, twenty-two federal agencies; employment and training. Focus: improved work experience leading to unsubsidized employment.
Young adult conservation corps	27 000	Productive work on conservation/water projects to strengthen occupational skills.
Youth community conservation and improvement programmes	13 000	Community improvement work programmes. Supervised work experience on community projects.
Summer youth employment programmes	1 009 000	Summer employment, generally in urban areas. Nominal training-educational component.
Secondary-Post-Secondary (Department of Labor, CETA Title 1 activities)		
Classroom training	580 000	Approximately 49 per cent of the participants in Title I programmes were under 22 years of age and 48 per cent were secondary/elementary school drop-outs. Programme objectives are marketable skill development and full-time unsubsidized employment.
On-the-job training	193 400	
Work experience	449 400	
Public service jobs	22 600	
Apprenticeship training (Department of Labor, Bureau of Apprenticeship Training)	362 000	Receiving training under state and national apprenticeship programmes in conjunction with trade unions; 108 000 new apprentices were registered/indentured in 1977.

Sources: See Table 3.

Table 6. Secondary school curriculum profile estimates by course, programme type, and instructional method: United States, 1980

Course title	Graduation requirement range in years	Typical four-year programme estimate, years of subject Programme type			Composite estimate of instructional method (percentage)		
		Academic	General	Vocational/ technical	Lecture	Class practice	Shop-laboratory practice
English-language arts Electives: literature, composition, reading, speech, journalism, theatre debate, remedial-basic	3–4	4	3	3	80	20	
Civics-government Electives: history, geography, social studies, economics, psychology, Sociology, anthropology	2–3	3	2	2	70	30	
Mathematics Electives: algebra, geometry, trigonometry, calculus, remedial-basic	1–2	3	2	2	65	35	
Science Electives: biology, chemistry, physical science, physics, earth science	1–2	4	1	1	65		35
Music and art Electives: music, band, chorus, art, ceramics, design, photography	—	1	1	1	30		70
Foreign language Electives: Spanish, French, German, Latin, Russian, Italian	—	3	—	—	35	40	25

Practical arts							
Typical electives: typing, industrial arts, clothing, cooking, basic auto mechanics, woodcrafts	—	2	6	1	35		65
Vocational-technical							
Programme areas: agriculture, distributive, health, home economics, office, technical, trades and industry	—		1	8	35		65
Study-activity							
Electives: study hall, library, student government, clubs, teaching assistant-aid	—		1	8	10	90	
Composite estimate of four-year instructional time distribution:							
Academic programme					51	24	25
General programme					40	23	38
Vocational programme					40	19	41

Source: Unpublished information.

ever, the extent and degree of local control is considerable and requirements minimal. The course-mix offered by most schools includes a broad selection of course titles. As mentioned earlier, over 2,100 course titles were recorded in the areas of: language arts, government, mathematics and science, practical and vocational arts, fine arts and physical education. Table 6 details course categories and gives a selection of elective course titles.

Local school authorities working with citizen advisory committees tailor the selection of course offerings to community or area wants and to economic needs. It is not uncommon for several classes or occupational programmes to be added or deleted in any given year in the light of new or lost regional employment. Vocational offerings in particular are sensitive to regional economic activity—both locally and in urban centres to which students traditionally migrate or commute for employment. Table 7 shows that 76 per cent of the office and business education classes were offered in the city areas and 93 per cent of the agricultural classes were held in rural areas and small cities.

In addition to the question of a balanced curriculum, the mid- and late 1970s saw a growing number of school districts implement the use of competency tests to ensure that all secondary school graduates possessed basic reading and numerical skills. (Competency testing has been in fairly common use in vocational courses since the early 1950s.) In the case of general courses or as applied to graduation requirements, competency testing is new. Oregon, for example, passed legislation requiring the class of 1978 to demonstrate proficiency in twenty competency areas including career entry level job skills. The recent Hart Bill—California (June 1979)—stipulates that no pupil may receive a high school diploma after 1980 if he or she cannot demonstrate proficiency in reading comprehension, writing and computation skills. In both the case of Oregon and California, minimum proficiency standards are to be set by each local school district.[1] While the legal status of basic skills competency tests has yet to be fully tested in the courts, it seems clear that the 1980s will see an increasing number of local schools seriously considering the addition of qualitative performance standards to school graduation requirements.

Student-course selection

On entering secondary school the student is confronted with an elective course selection system. Only a handful of courses are required; all others

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[1] Most states have published guides and materials for local schools to use in developing competency tests. The California State Department of Education's *Technical Assistance Guide for Proficiency Assessment*, coupled with two volumes of sample exercises for grades 6–12 published in 1977 and 1978, are indicative of the current state of the act in competency testing.

TABLE 7. Secondary-school vocational-education enrolment by programme category and place of student residence: United States, 1972/73 (percentages)

Programme category	Place of student residence		
	Large city and suburbs	Small city	Rural areas
Agriculture	5	62	62
Distributive education	40	43	17
Health programmes	30	48	22
Home economics	27	46	27
Office and business programmes	38	38	24
Technical education	40	41	19
Trades and industry	32	40	28

Source: United States Office of Education, *Vocational Education: Characteristics of Students and Staff, 1972, 1974.*

are optional. Each student is responsible for selecting his or her own courses, normally on a year-to-year basis. While individualized programmes of study exist, i.e. students are free to change programme direction to any point, programmes of study tend to be categorized as college preparatory (academic), general and vocational.

Two-thirds of secondary-school students tune their studies to college entrance or vocational education. The choices are more 'directional' than specific career decisions. It is only the occasional vocational programme, for example, that allows for a high degree of specialization in secondary school. Most of the vocational students enrolled in the programme categories listed in Table 8 are receiving job-family or cluster-level instruction.

Virtually all secondary schools have guidance staff and provide counselling services to students. Pupil-counsellor ratios vary (e.g. 250–500 : 1) as do local career centre materials, testing services, and college/employer recruitment activities. Larger schools, even though pupil-teacher ratios may be greater, generally offer a more complete range of counselling services. The common complaint among vocational teachers has been that vocational counselling is a second-level priority, i.e. academic students receive more assistance. Students, on the other hand, appear reasonably satisfied with school guidance services: across all programme categories, over 83 per cent of the 16,300 grade 12 students nationally surveyed in 1972 indicated they had ready access to counselling staff and 80 per cent indicated satisfaction with the services received.

It should be point out that even though graduation course requirements are modest (see Table 6) the system is not completely without structure. Most universities suggest or recommend a prescribed set of courses, and, if anything, the list tends to grow longer each year (e.g. University of California will require four years of English in 1980, up from three years during the 1970s). Frequently most college preparatory students have only a handful of one-semester electives to 'invest' in practical or vocational courses. Similarly, vocational students, because of multiple-period or block-time instruction at area vocational schools, sometimes find it difficult to design a fully satisfactory vocational-college preparatory programme. This caveat aside, the open-door admissions policy of American higher education, coupled with a dense network of community colleges and universities (rarely more than thirty minutes' drive from a student's home), assures all students entrance into higher education should they so desire.

Curriculum programme categories

The programme categories of college preparatory (academic), general and vocational are approximations. Only on rare occasions will a school tightly package all of its courses into three programme options. The terms, however, are commonly used by students, parents and educators alike to describe a student's programme pathway through secondary school. The only generalizations that can be safely made about academic programme students are that they are anxious to attend college and that some of them may have been counselled into the academic programme

TABLE 8. Secondary and post-secondary vocational education enrolments in federally supported programmes by programme category: United States, 1976/77

Programme category	Secondary—percentage of women[1]	Enrolment distribution in:	
		Secondary	Post-secondary
	%	%	%
Agriculture	6.3	8.2	3.2
Distributive education	59.1	4.2	9.0
Home economics	80.7	1.2	13.4
Home economics-gainful	—	31.1	2.2
Office and business programmes	83.2	21.0	28.8
Technical education	11.9	.1	14.4
Trades and industry	14.4	15.5	26.1
Group guidance	—	10.6	.1
Industrial arts	—	5.2	.0
Total enrolment		8 707 393	2 167 345

1. Data for 1972/73.

Source: United States Office of Education, *Vocational and technical Education, Selected Statistical Tables, 1976–1977, 1978.*

because of high ability. Not infrequently, high-ability (achievement test scores) vocational students are counselled out of vocational programmes into college preparatory courses.

General programme students fall into two groups: (a) students without any particular plans for further education or who are not interested in the vocational programme offerings, and (b) medium- to low-ability students who are working their way through secondary school. Vocational programme students also fall into two categories: (a) students who have made a definite career choice, and (b) medium- to low-ability students, and occasionally problem students, who have been encouraged by counselling staff to enrol in vocational courses.

Structurally, the programme categories vary considerably in their course-mix composition, in instructional method, and in the educational management of out-of-school or shadow curriculum. As Table 9 shows, academic students will normally take four to five subjects (e.g. language, social science, mathematics, science, and foreign language) each year while vocational/general students carry half as many. This distribution is made clearer in Figure 5 where it can be seen that virtually all of the course time of academic students is spent in general courses (92 per cent) with vocational students spending considerably less (58 per cent).

Instructional methods

Learning by doing, practical experience, relevant instruction, etc. are accurate instructional method descriptors for both academic and vocational education in the United States. Even lectures more frequently

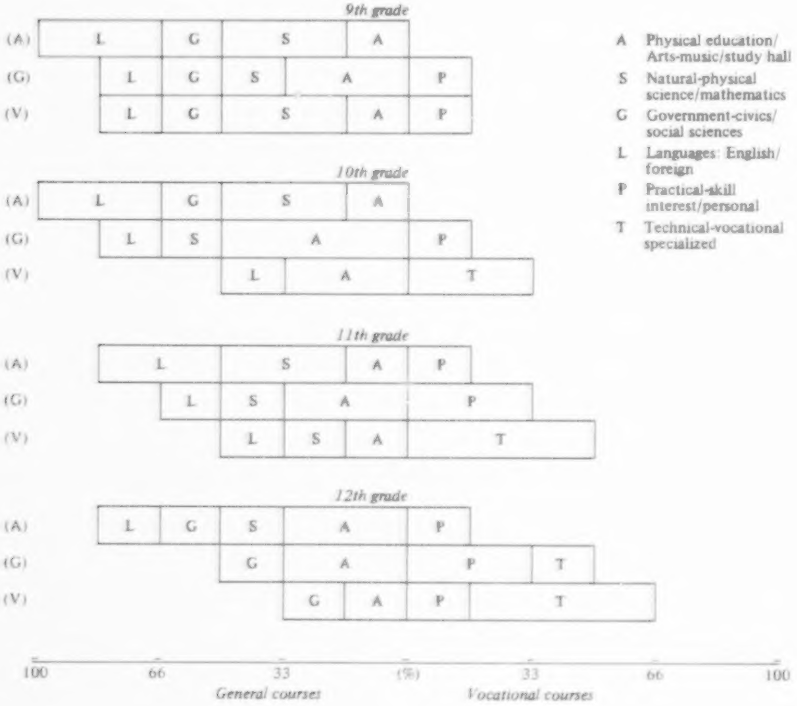
TABLE 9. Secondary-school instructional methods utilized frequently or fairly often during grade 12, by programme type: student opinion, United States. 1972

Instructional methods	Frequency—programme type		
	Academic %	General %	Vocational %
Listening to lectures	88	82	77
Writing papers, essays, etc.	72	60	54
Student-centred discussion	65	57	53
Project or laboratory work	57	38	42
Small group instruction	22	24	27
Self-instruction equipment	8	11	21
Field trips	9	11	14
Television lectures	5	7	6

Source: National Center for Educational Statistics, *National Longitudinal Study of the High School Class of 1972: Student Questionnaire and Test Results by Sex, High School Program, Ethnic Category, and Father's Education, (1975).*

take the form of class discussion rather than teacher-centred presentations. Table 9 brings this point into focus. A great deal of instructional time is given to individual and group-project exercises involving a series of skill or ability elements centred on student activities such as school plays, laboratory reports, landscaping, etc.

As could be expected, vocational students spend more time in shop and laboratory practice—41 per cent of the total as opposed to 25 per cent for academic students. Perhaps most revealing is the almost even time split (51–49 per cent) for academic students between lecture and practical exercises. Generalizations concerning the quality of practical



Programme	Technical	General	Practical
(A) Academic	–	92	8
(G) General	4	71	25
(V) Vocational	34	58	8

Course distribution (%)

FIG. 5. Secondary-school curriculum analysis for academic, general, and vocational programme concentrations, 1980.

work between subject-matter areas are not especially productive, e.g. language and chemistry laboratories 'compared' with machine and auto shops; the practical arts of oral communication (debate, speech, meeting management, and drama) are common to all vocations. Each subject area has a great number of practical applications. The most revealing point is the degree to which practice is a natural part of secondary schooling, either planned or by chance. Table 10 provides a glimpse of the practical work experience gained by secondary students.

Many students will affirm that their main reason for attending school is to participate in such activities as team sports, clubs, the school band and school plays (see Table 11). American secondary schools rely heavily on these curricular and extra-curricular activities as instructional methods to develop social skills, leadership ability and independence. There is a higher degree of participation rate in team sports (53 per cent) among academic students compared to vocational students (32 per cent), due in part to socio-economic factors.

The regular use of vocational student organizations as an instructional catalyst is fairly specific to vocational education. Extensive use is made of exhibitions and competitions to reinforce the development of cricital performance skills and to integrate new technology into the existing curriculum. The degree of student self-motivation towards excellence is clearly visible in competitions and contests organized by such vocational clubs as the Future Farmers of America and the Vocational Industrial Clubs of America:

1. *Exhibition competitions*, Local community and regional fairs where prizes are awarded to student competitors (ribbons and money) in a full range of projects: machine tool drawings, furniture, account books, clothing and animals.
2. *Judging contests*. Team competitions in virtually every occupational area: parliamentary meeting procedures, automotive engine analyses, medical practices, computer programming, welding, and public speaking.

The sociology of vocational club activities offers an excellent example of how a local school can harness community learning resources so as to optimize and extend the educational benefits of the school: local employers and craftsmen become an active part of instruction as they donate time and materials, and share equipment. Community college and university students work with students and local teachers in putting on events. Vocational teachers are urged by their students to keep in active communication with other local and regional teachers on club-sponsored activities. Such intercommunication makes for a higher standard of excellence.

The early 1970s saw academic and vocational teachers rewrite course objectives in behavioural terms. The late 1970s saw the behavioural

TABLE 10. Work experience activity of secondary-school students by programme area, work experience programme, sex, and race: United States, 1972 (percentages)

Student category	Programme[1]		Employment status (hours per week)		
	Co-operative	Work-study	Yes	11–20	20+
Programme area					
Academic	3	3	74	24	21
General	7	11	76	21	31
Vocational	18	22	80	21	37
Sex					
Male	8	11	82	23	38
Female	7	10	71	24	21
Race					
White	7	11	78	23	29
Black	10	17	64	21	21
Hispanic	8	12	71	21	27

1. *Co-operative programmes* combine class-related instruction with job-work experience. Work experience is supervised/co-ordinated by school staff. Co-operative programmes are time-flexible and generally take place during grades 11 and 12. *Work-study programmes* are employment programmes limited to low-income family students. They provide up to twenty hours of paid work per week. No related vocational instruction is provided in work-study programmes. Work locations in co-operative programmes are the result of student and vocational advisory committee efforts. Work-study programme locations are provided entirely by the school. *Employment* reported in the right columns of the table is for the most part student-initiated; it includes co-operative and work-study programme employment.

Source: National Center for Educational Statistics, *National Longitudinal Study of the High School Class of 1972: Student Questionnaire and Test Results by Sex, High School Program, Ethnic Category and Father's Education*, 1975.

TABLE 11. Student participation in secondary-school activities by programme type: United States, 1972 (percentages)

School activity	Student participation by programme type		
Athletic teams—sports clubs	53	43	32
Debating, band, chorus	39	33	22
Hobby clubs	18	20	19
Honour clubs—scholastic	25	7	7
Student government	27	15	12
Vocational club	14	24	37

Source: National Center for Educational Statistics, *National Longitudinal Study of the High School Class of 1972: Student Questionnaire and Test Results by Sex, High School Program, Ethnic Category, and Father's Education*, 1975.

objective era giving way to competency-based instruction (CBI). In both cases, the purpose is to state learning objectives in measurable terms utilizing quantitative terminology: accuracy levels, tolerances, timing, sequential steps, etc. In the strict sense, neither behavioural objectives nor competency-based instruction are instructional methods per se (i.e. the terms belong to the terminology of instructional systems designers). There is no mistaking the pervasiveness of the CBI mentality among American educators: secondary curricula and university teacher-training programmes are being rewritten with CBI terms of reference. Readers should be aware that American educators frequently speak of CBI as an instructional method.

Instructional materials

Texts and instructional materials are the sole responsibility of each school. For general subject-matter areas, most states maintain an extensive listing that local schools utilize in making their final decision.

In an attempt to keep vocational teachers 'curriculum-current', most states have established instructional material centres specifically for vocational materials. Centres secure their instructional material by searching-out/gathering material published in other states and by contracting with universities and local instructors to produce needed materials. The National Centre for Research in Vocational Education at Ohio State University serves as a fairly complete national depository of secondary and post-secondary vocational curricula. The centre also develops vocational education curriculum products and sells material on a cost basis to local schools.

Most vocational teachers find it necessary to adapt virtually all the instructional material they receive. As a consequence, no single source of curriculum material is used exclusively. Most teachers use five sources on a regular basis: (a) learning materials supplied by manufacturers of equipment—in-service materials and consumer information, (b) commercial book publishing materials—particularly popular for career educational materials, (c) Instructional materials centres—for module- and unit-level materials, (d) trade magazines—plans, articles, new technology information, and (e) colleagues and professional teacher associations—personal feedback and critical evaluation of existing or new materials.

Instructional facilities

A single comprehensive school facility houses both the academic and vocational course offerings. Depending on the size of the school, the school plant is either a single building or a contiguous building complex (approximately 20 per cent of the secondary schools have enrolments of more than 1,500 students and 10 per cent under 250 students). Minimum space and building safety standards are prescribed by state authorities. Diversity in the type and quality of programme space and equipment varies considerably both within and between schools. Much of the diversity is imposed, that is, enrolment and the taxable property base are somewhat inelastic (local property tax was the sole source of school revenue for many years). This being said, secondary curriculum offerings and the quality of school facilities are a fair indicator of the local attitude towards education.

School district consolidations, particularly in rural areas, coupled with special state and federal vocational education aid programmes in the 1960s and 1970s, have resulted in the renewal or construction of many vocational facilities. Area secondary vocational schools, many constructed in rural areas and in the suburbs of medium-sized cities, represent the newest thinking in respect of vocational education facilities and instruction: extensive programme offerings—from twenty to fifty or sixty, common classrooms, self-instruction library centre pods, well-equipped shop space, competency-based instruction, open entry admission, double and triple shift class scheduling to accommodate adults working swing shifts.

Rural-urban secondary schools

Rural and urban schools are different in a number of ways. It has always been difficult to attract good teachers to rural schools (ironically, centre-city schools now have the same problem for different reasons). Similarly it has not been easy to keep teachers happy in isolated regions: housing, medical services, recreation and cultural activities are sparse. Rural schools are consistently treated unfairly when it comes to funding—even in such a decentralized educational system as that of the United States.

The data in Table 12 indicate some of the qualitative differences in the educational process between small (mainly rural) and large urban schools. There is no question that the process is more varied and richer in experience in urban schools: year-round schooling, guidance services, and a broader range of special programmes for the gifted student. The question must, however, be asked: do these differences in the rural-urban educational process harm student development? While there is no doubt that future educational opportunity is limited by the fact that rural students live where they do, no one is ready to make the generalization that rural students have been permanently disabled as 'educational performers'.

The long-term social consequences of the different attitudes *vis-à-vis*

TABLE 12. Instructional resources available and utilized by secondary schools, by size of school: Unites Stated, 1972/73 (percentages)

Instructional resources utilized	School enrolment		
	> 300	500–999	< 1,500
Field trips	95	95	95
Outside specialists for class instruction	70	76	76
Closed-circuit television	8	21	26
Cultural performances in school	34	48	52
Individual student counselling	87	96	97
Summer school session	12	52	55
Early entrance programme to college	14	15	46
Computer access for mathematics classes	3	23	47
Computer access for non-mathematics classes	2	12	33
Special tutoring for gifted students	8	19	26
Special tutoring for disadvantaged students	42	61	54
Non-professional career guidance staff	30	43	62
Grade 7 and 8 students in grade 9–12 classes	9	30	20

Source: National Center for Educational Statistics, *Course Offerings, Enrollments, and Curriculum Practices in Public Secondary Schools, 1972–3*, 1977

education/work as between rural and urban students (exhibited in programme enrolment patterns) is the 'difference' that most immediately affects school-to-work transition. Rural students consistently enrol in vocational programmes in proportionately greater numbers than city students. Tables 3 and 11 show the figure to be twice as high. The figure is three times higher when rural students are compared to those residing in the more affluent suburbs of larger cities.

Teaching cadre

The average American secondary school teacher is 36 years of age and has eight years of teaching experience—14 per cent of the teachers have over twenty years of teaching experience.

There are slightly more men (52 per cent) than women, although 87 per cent of elementary school teachers are women. The majority are employed on a nine-month contract at an annual salary of $12,200 (1976). Virtually all (99 per cent) have four-year university degrees—42 per cent hold Master's degrees and 4 per cent hold Ph.D. degrees. All teachers are certified by their respective state education authorities and well over 95 per cent hold regular teaching certificates.

Vocational teachers vary from the norm in several significant respects:

1. Academic degrees—24 per cent of men 30–45 years of age had less than a four-year degree and 33 per cent of those over 45 years of age. Women follow the national norms fairly closely, although they have fewer degrees.
2. Teaching contracts: one-third are employed on an eleven or twelve-month contract, with over 80 per cent of agricultural teachers on a yearly contract.
3. Certification: approximately 10 per cent hold provisional certificates (generally having not taken professional educational courses).
4. Source: general-subject teachers are recruited from the university; vocational teachers are recruited from both university and industry.

Perhaps the greatest difference between vocational and academic instructors is in terms of work experience related to the field in which they are teaching. Three out of four vocational teachers have had one or more years of non-teaching work experience in their specific field. This varies from less than 40 per cent for home economics teachers to 94 per cent for those teaching in distributive education. Ten or more years of average working experience is the norm for 45 per cent of the trade, industry and health teachers. Most states require that vocational teachers gain work experience in order to be permanently certified. Work experience is not required for certification of general-subject teachers. It should be noted that the work experience levels contained in Table 13 represent minimum levels for certification.

Teacher professional development

The professional education of secondary teachers is completed at university/college either wholly within a faculty or college of education or in co-operation with another faculty (e.g. agriculture, engineering, business). Professional education courses generally occupy a total of three semesters—stretched across an eight-semester, four-year programme of study. Each university tailors its own programme, which generally exceeds state teacher certification standards.

A vast majority of secondary teachers complete their preparation in four years. Vocational teachers are the exception because of delayed study patterns/work breaks (generally voluntary rather than prescribed by the university).

Professional teacher education course work is commonly divided into three segments:

1. *Professional core courses*. These are required of all student teachers; general-subject and vocational teachers are enrolled together. The courses carry such titles as: Introduction to Education, Foundations of Secondary Education, and Educational Psychology and, frequently, Career Guidance.

TABLE 13. Formal education and occupational experience requirements required for secondary-level vocational teacher certification United States, 1977/78.

	Agricultural education	Business/office education	Health programmes education	Home economics education	Technical education	Trades and industry education
States permitting less than four years of college for regular teaching certification (in percentage)	13	8	46	10	55	68
States requiring occupational experience (in percentage)	45	52	67	36	64	83
Average number of years required	2.05	1.70	2.79	1.78	3.30	3.64
Number of years most frequently required	2	1	2	2	2	2
Range in the amount of occupational experience required (years)	1–6	1–6	1–8	0.75–4	1–6	1–8

Source: John D. Skinkle, *Certification Standards For Vocational Educators: The Implications For Professional Development Policy*, Ph D Thesis, University of Minnesota, (1978).

2. *Teaching methods courses*. Students are generally separated by specializations (e.g. social studies, English, agriculture, health) although it is not uncommon to see some combining of vocational specializations. A minimum of two courses occur in this sequence: Curriculum Development and Teaching Methods/Instructional Materials Preparation. Separate courses in Instructional Materials and an Educational Tests and Measurements course are frequently required.
3. *Practice teaching*. Generally eight to sixteen weeks of full-time teaching in a local school. Supervision of student teachers is provided by an experienced local teacher, with co-ordinating visits (three-four) by university staff to evaluate student progress.

There is a high degree of secondary-teacher participation in continuing education activities, particularly in those activities leading to an advanced degree. While states may require teachers to accumulate course credits (or their equivalent) to maintain permanent certification, salary raises provide a strong economic incentive to engage in permanent education activities.

There is no regular pattern of formal in-service education activities common to general and vocational teachers, except when working toward a Master's degree (approximately 42 per cent possess M.S. degrees). Professional continuing education activities are organized by: local schools (approximately three-four institute days each year), universities (e.g. external degrees and extension courses offered locally), and state departments of education (e.g. workshops and locally funded research). It should be noted that some school districts continue to offer paid sabbatical leaves for permanent teachers (e.g. one-two semesters) for continuing education activities. The overall tightening of school revenue and inflation is eroding the number of sabbaticals each year.

In many states the professional vocational teachers' organization and the teacher education departments in their states jointly sponsor summer workshops. In several states (e.g. California and Arkansas) the one- and two-week workshops are conducted as family camp outings. Teachers will bring their families—the mornings being devoted to instruction or project activity and the afternoon and evening to family recreation: canoeing, swimming, fishing, etc.

Occasionally a school will fill a vocational teacher vacancy with a person from private industry having solid work experience and obvious personal comunications ability, but generally without formal higher education or professional education training. States will issue provisional teaching certificates based on the recommendation of a local school superintendent and advisory committee. Generally, such persons will attend extension education courses or workshops during school vacation periods or in the summer to upgrade their certificate to permanent or regular status.

Transition between school and work

A major new concern of some government employment and economic policy-makers is that too few young people are becoming economically productive adults fast enough, in other words, youth unemployment rates are too high. Economic planners are not bashful when it comes to laying their problems on the school-house steps. Statements are made to the effect that secondary-school students need an improved career development process that will successfully bring them into meaningful employment. In effect the secondary school is being viewed as *the* critical institution in putting youth to work. This is not the place to argue this specious point of view but it should be noted that economic conditions, international commerce, and technological turnover are beyond the control of the school. Before any wholesale rearranging of the secondary-school system takes place, it might be well to look at what the American secondary school is doing today to facilitate the transition from school to work. Six areas may be briefly examined:

1. *Career exploration.* Grades 7 and 8 are being used for career exploration—mini-occupational exploratory courses (four to eight weeks) are generally required for all students. These cut across the fields of technology, science, business, practical arts, etc. The last fifteen years has seen a flow of early childhood education materials developed by educational laboratories and textbook companies. These have been fused to the existing K-6 curriculum along with project activities. *Career Education Programmes That Work* and *Education In Action—50 Ideas That Work*, both published by the United States Office of Education, detail career education efforts.
2. *Counselling and placement services.* Most schools provide counselling services for further education, vocational planning, and personal problems. Not all, but many schools, particularly in the past ten years, have developed career information centres that provide testing services, employer/university recruitment co-ordination, and mini-work experience programmes to explore career choices. Job placement counsellors are becoming common in urban schools.
3. *Vocational advisory committees.* Specific to vocational programmes, committee members provide a vital link to jobs through providing work experience locations for in-school students and directing graduates to where work can be found. Advisory committees provide programme intelligence in terms of new technology and manpower supplies to make programme graduates more competitive on the labour market.
4. *Employment service links.* By the mid 1970s, most state-level vocational education divisions had integrated Department of Labor manpower projection data into one- and five-year manpower development plans. Data resources have been shared with local districts for

incorporation in local plans. Employment service liaison with secondary schools continues to take place at the information-sharing level, although in an increasing number of schools CETA/Youth Employment-Training contracts exist to provide school drop-outs with a second educational chance.

5. *Co-operative and work experience programmes.* Traditionally, co-operative and work experience programmes have provided the best immediate bridge from school to work. Nationally, a solid 25 per cent of vocational students are enrolled in a programme that has a teacher-supervised work experience component. On a school-wide basis, from 10 to 15 per cent of the students have participated in work-study programmes, generally youth employment activities in the public sector during school or summer holiday periods (e.g. neighborhood youth corps, work-study programmes (see Tables 10 and 14).
6. *Non-traditional programmes.* There are three programme areas: Military Service, CETA/Youth Employment-Training Programmes and post-secondary schools. All offer 'second chance' opportunities for secondary school graduates and unemployed school drop-outs. Military service (three to four years or a twenty-year career) has been used by many to gain technical training (e.g. electronics, medical occupations, machinery maintenance) and work experience. CETA-type programmes offer both skill training (twelve to forty-eight weeks) and a chance to complete a secondary diploma. Military service also offers this opportunity as well as completion of higher education. The community college open-door admissions policy offers an opportunity to *all* persons desiring further education or skill training. Higher education is available, at very nominal cost, to virtually all persons willing to attend a community college.

Conclusion

American secondary education will no doubt continue through the 1980s as a highly decentralized system: one marked by local control. Curriculum diversity will continue to grow as new efforts are launched to ensure that the secondary-school graduate possesses basic skills. Issues relating to educational equity and discrimination (e.g. language, sex, race, place of residence) will continue to mark the federal government's direct involvement in the affairs of local schools. The early 1980s will see an active national effort to enmesh traditional secondary vocational education in youth employment-training programmes. Just what long-term structural effects this will have on the comprehensive secondary school—as the school becomes a full partner in public employment programmes—is not clear. What is clear is that the task of putting all the nation's students within a single school system is decidely different from putting and keeping the United States at work.

Table 14. Continuing education and employment status of June 1972 secondary school graduates by programme type: national longitudinal study of high school seniors: United States, October 1972 and October 1973 (percentages)

	Programme/type					
	Vocational		General		Academic	
	1972	1973	1972	1973	1972	1973
In school						
Four-year institution						
Study only	3.1	2.8	11.0	8.3	39.2	30.7
Work-study	2.4	2.2	5.1	5.9	15.6	19.3
One-two year institution						
Study only	9.6	4.7	11.2	7.4	10.5	7.3
Work-study	13.5	10.1	13.9	10.8	14.9	14.0
Out of school						
Work only	59.4	46.8	46.8	50.8	13.6	21.1
Looking for work	4.6	4.2	4.2	2.9	1.0	1.3
Home-maker only	3.4	3.6	3.6	5.5	.9	1.6
Other	3.9	4.1	4.1	3.1	1.6	2.1

Source: National Center for Educational Statistics, *Fulfillment of Short-Term Educational Plans and Continuance in Education: National Longitudinal Study of High School Seniors*, 1972.

As we have noted, American secondary education is provincial. It is highly localized. Regional co-operation can be spectacular, e.g. area vocational schools. Inter-state and international co-operation is on a much smaller scale: agency reports, library holdings, and workshop proceedings. A great deal of active collaboration, although it goes unreported, is considerably more important to the teacher than that contained in annual reports. The natural ebb and flow of teachers as they travel about has a direct impact on their professional life. Educational innovation is brought home and institutionalized by direct carriers: a Kalamazoo machine-shop teacher brings back exercise/shop plans from a MAVO school visited during a holiday in the Netherlands, a Portland kindergarten teacher brings back 'Naturvett' materials from Scandanavia for an environmental unit, a Californian horticultural instructor brings back a new design for plastic tunnel production of vegetables discovered while on a grower's tour in southern France.

Secondary education, both in the United States and internationally, does some things better than others. For example, schools are better equipped to provide educational opportunities and offer access to learning resources for individual students and parents than to act as political agencies to alter wages or keep society at work. Perhaps the role and concept of the secondary school will be changed in the 1980s; in any case, much of what the manpower/economic planners expect of schools is simply beyond the contemporary secondary school's ability to perform.

In searching for ways of strengthening education, it is reasonable to start with the obvious: a school-based educational system is 'design limited' to be incomplete when viewed alongside a community or society-based system. Education requires complete access to learning resources. Further, we are certainly mature enough to accept the fact that general and vocational subject-matter is really a single element and not two, as the title of this paper suggests. The task before us is to breathe life into an education that finds it unacceptable to view man as anything less than a truly responsible whole person. The notion of limited learning responsibility has no place in education. Simone de Beauvoir, in her *Ethics of Ambiguity* (pp. 82–3) insists that we must be completely responsible to our students:

> My freedom, in order to fulfil itself, requires that it emerge into an open future: it is other men who open the future to me, it is they who, setting up the world of tomorrow, define my future; but if, instead of allowing me to participate in this constructive movement, they oblige me to consume my transcendence in vain, if they keep me below the level which they have conquered and on the basis of which new conquests will be achieved, then they are cutting me off from the future, they are changing me into a thing.

In proposing an agenda for strengthening secondary education—focused on building an integrated curriculum and gaining a fuller and more active use of community learning resources, the following items might be considered.

Community learning resources

Within recent history all education was community-based. The reservoir of learning resources in most communities (parents, craftsmen, employers, industrial facilities and equipment, and social infrastructure) dwarf those normally utilized by school-based education. Educators are finding ways to maximize community resources through work-learn experience programmes, industrial space and equipment sharing, craftsman-teacher team teaching, advisory committees, etc. Some schools have even begun a dramatic reappraisal of in-school learning resources such as the Phillippines' INNOTECH programme, which utilizes elementary students as teachers.

The inventory of community learning resources is incomplete as is the listing of programme approaches designed to achieve integration. The family, industry and environment respresent an educational source that remains largely unexploited by educators. The identification and full integration of society's learning resources into the process of education is vital.

Youth-club activities

Group socialization opportunities may be justification enough for teachers and schools to support vocational subject-matter or hobby clubs. However, the instructional opportunities are real in terms of using the club as a planned learning catalyst in areas such as: leadership development, introduction of new technology in curriculum materials, strengthening of students' standards of excellence, and as a motivator for teacher in-service education.

Again, the inventory and strategies for the implementation of youth club instructional activities is incomplete: contests, competitions, social activities, projects, organizational approaches, materials development, industry-community co-operation/role, etc.

Educational experimentation

The science of manpower planning is macro at best. Sensitive intelligence at the firm and employee level, even if it were available, will not strengthen the exercise measurably. At best, manpower projections are made on turbulent pasts held economically constant. Predicting technological turn-over is a hazardous exercise. Far too many schools and students are turned away from instructional activity—and heavy social investments made from limited revenues—on the basis of very tentative manpower planning data.

It seems a reasonable exercise to sensitize the process of education with manpower knowledge. The question is not one of ignoring manpower intelligence data in planning school affairs, but of searching for alternative uses and applications of manpower data for students and school planners.

Industrialized education

The vocabulary used by educators—school plants, student raw material, curriculum products, performance standards, unit costs, target audiences, market territories, compliance regulations, etc.—all indicate the depersonalization of what should be essentially personal: one's education.

A child is born with two teachers for parents. As an apprentice he or she may have three or four 'responsible' teachers. In the modern school, the student-teacher ratio is often over 30 to 1. Modern instructional systems segregate students, they tend to treat learners as 'class units' rather than individuals. Subject-matter is neutral in this regard.

The reorganization of the industrial approach to education needs constructive debate. The modern school system is young and still quite malleable so that it should be possible for education to be personalized once more.

Conclusion

The case-studies on the integration of general and technical and vocational education clearly indicate the progress made in this field in a number of countries. In general, it can be concluded that there is no one solution to the integration problem. In reading the case-studies, it can be seen that each country has found a strategy suited to the local situation. One thing, however, is very clear—there is definitely an overall trend towards integration, and the need for increased democratization of education and training systems has become a major political issue.

Policy formulation and trends

The processing of legislation and the formulation of policies varies from country to country. In most countries, a two-thirds majority is required to pass educational legislation and it is therefore understandable that such legislation does not change rapidly. Education concerns all members of society, and a broad consensus is consequently required if democracy is to be functional. The major issue, however, is to determine whether education should be oriented towards society's needs, towards the individual or towards certain groups in society. It is for this reason that a consensus has not yet been reached everywhere on the desirability of integrating technical and vocational education with general education.

The case-studies permit a comparison between various examples. In Finland—as well as in other Scandinavian countries—it can be seen that the comprehensive school has become a reality; the Austrian case-study shows that change can only take place gradually, starting from an experimental pilot programme and leading to legislative enactments. Equally noteworthy are the difficulties experienced by certain countries having federal systems, for example, Australia and the United States, where the federal governments have no legislative power over education, such power being wholly at state level. It should be mentioned here that Australia has chosen one state—Queensland—for the case-study, with a view to providing a more precise description. It should be kept in mind, however, that this study does not reflect the situation in all the other states, even where the development has been similar. The United States report has attempted the nearly impossible task of describing trends throughout the whole country, but has mainly concentrated on upper-secondary-level education. Policy, however, may not concern only one state, but may require co-ordinated efforts in all states. Whatever the advantages of adjusting education to meet the state's needs, and hence those of society, there are also certain hard facts that strongly militate in favour of national standards, at federal level, which guarantee free movement, equal access and the recognition of qualifications and certificates.

The reasons underlying any reform may also differ considerably. One of the most pressing considerations is in the socio-economic sphere. The increasing rate of youth unemployment, in particular, has become a serious problem for a number of governments. More and more general secondary school-leavers, prepared only to enter the university system, are unable to find a place in the university and are also unable to find work openings in the economy. The need to orient the educational system towards the manpower requirements of economic development has therefore become a priority, particularly in the developing countries. Certain countries have accordingly decided to vocationalize general education in such a way that every school-leaver will possess enough general education to enter the higher education system, while at the same time having a job qualification. In some countries, the entrance requirement for higher education even includes one or two years of job experience.

The integration of general and technical and vocational education may also be seen from an educational point of view, where, it should be noted, there is a definite disparity of views. Educationists agree in general on the value of including vocational aspects in general education and, especially, of bringing together 'hand and mind', thus changing attitudes towards manual work. Objections exist, however, on the grounds of high cost and overloading of curricula. Resistance also comes from the teachers themselves, who feel that the addition of new elements in the education system makes their position less secure.

The major issue, however, is the political factor mentioned above. Can an élite education be tolerated, or should we move towards further democratization of the education system? Clearly, the majority of governments have chosen the latter course. One specific and important aspect of such democratization is the access of girls and women to technical and vocational education. In 1980, two Unesco meetings were convened in the Federal Republic of Germany on this issue.[1] One of the conclusions reached was that not only must the education system change, but employment conditions and social services (in a word, the whole of society) must also change if women are to have rights equal to those of men.

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[1] International Seminar on Opening-up to Women of Vocational Training and Jobs Traditionally Occupied by Men, Frankfurt, 11–13 November 1980; International Congress on the Situation of Women in Technical and Vocational Education, Bonn, 9–12 June 1980.

Policy decisions and norms for adequate examination systems must also be established if integration—or, at least, articulation—between the two systems is to be improved. The case-studies clearly show the trend towards utilizing objective testing, and some countries (Brazil, for example) have mentioned the introduction of a credit system. It will be essential to find ways and means of awarding full credit for practical experience which, in most cases, is indispensable to the development of manual and social skills. In this regard, it should be mentioned that Unesco executes a number of operational projects financed by the United Nations Development Programme, the World Bank and other funding sources. In India, for example, one such project is designed to set up a national testing service for technicians, and in this context a computer-assisted test item bank is being established in Bhopal. The experiences gained from such a project could well be of interest to other countries attempting to reform their examination systems. Standards and qualifications have always been a concern of Unesco, and a Convention on the Recognition of Studies, Diplomas and Degrees concerning higher Education in the States belonging to the European Region was adopted in December 1979.

Integration at the first stage of secondary education (age-group 12–15)

In the last twenty years, major changes have occurred in this level of education which, in many countries, is still part of the compulsory education system. Premature specialization has been abandoned and, in consequence, technical and vocational education in the traditional sense no longer exists at this level. General education, however, has been changed to include some elements of technical and vocational education in order to reorient education towards modern society. The case-studies indicate that there are many different terms for these aspects of general education: in Australia, manual arts; in Pakistan, agro-technical studies; in the United States, practical arts or industrial arts. In other countries, the term technology education is used, and in the Eastern European countries, the concept is known as polytechnical education. Some countries offer options. In Australia's manual arts, for example, a general option, a technical option or home economics is proposed. All of the options also include a vocational and educational guidance element. In agriculturally oriented countries, agricultural arts play a dominant role.

Just as the variety of terms used sometimes leads to confusion, the different philosophical approaches to the concept of technical and vocational aspects of general education can also lead to an ambiguous interpretation of what this type of education should represent.

In Unesco's *Revised Recommendation concerning Technical and Vocational Education*, adopted in 1974 by the General Conference at its eighteenth session, Chapter IV gives a precise description of what the General Conference considered the most suitable approach to this type of education. According to this instrument, technical and vocational initiation in general education should perform the following three functions, as stated in paragraph 21:

> (a) to enlarge educational horizons by serving as an introduction to the world of work and the world of technology and its products through the exploration of materials, tools, techniques and the process of production, distribution and management as a whole, and to broaden the learning process through practical experience; (b) to orient those with the interest and ability toward technical and vocational education as preparation for an occupational field or toward training outside the formal education system; (c) to promote in those who will leave formal education at whatever level but with no specific occupational aims or skills, attitudes of mind and ways of thought likely to enhance their aptitudes and potential, to facilitate the choice of an occupation and access to a first job, and to permit them to continue their vocational training and personal education.

More specific objectives are outlined in paragraph 22 of this instrument.

Unesco has also published a terminology guide,[1] which sets down the term preferred for use in Unesco publications, 'general technical education'.

One of the criteria for general technical education is its practical content. The various concepts differ in the ratio of theory to practice. Figure 1 shows the whole range of concepts from the relatively theoretical concept of applied sciences to the highly practical concept of prevocational training. General technical education is considered as lying somewhere between these two extremes. It may be noted that France has recently changed its concept of this type of education and that this change is reflected in the substitution of the term 'manual and technical education' (*éducation manuelle et technique*) for the expression 'technological initiation' (*initiation technologique*).

From a historical point of view, this type of education previously existed in the very narrow form of handicrafts in some of the traditional education systems, where boys learned the basics of paper work, leather work and woodwork while girls were taught needlework. About fifty years ago, however, a much broader concept was developed in the

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[1] *Terminology of Technical and Vocational Education/Terminologie de l'enseignement technique et professionnel*, Unesco-Ibedata, Paris, 1978. (Bilingual English/French guide.)

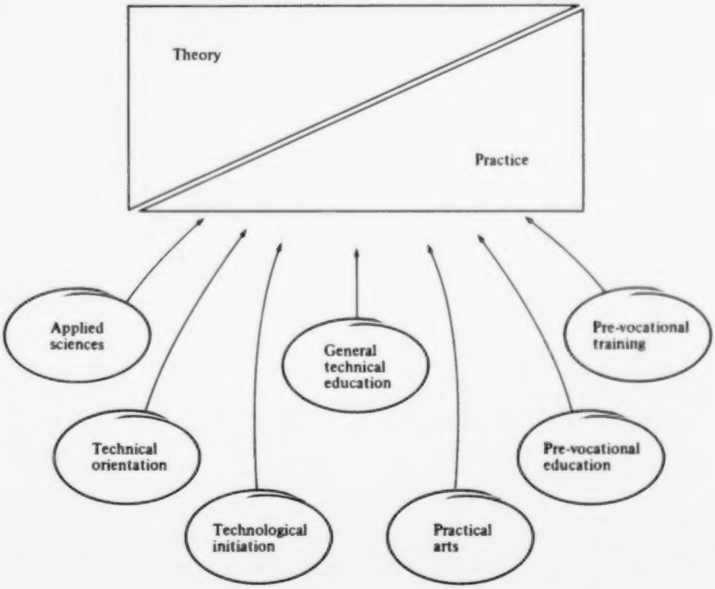
Theory
Practice
Applied sciences
Technical orientation
Technological initiation
General technical education
Practical arts
Pre-vocational education
Pre-vocational training

FIG. 1. Range of concepts in technical education.

Scandanavian countries known as SLOYD, which also took into consideration future employment needs.

Today, in virtually all countries, a trend can be recognized towards including general technical education in lower-secondary education and the necessary legislation is already in effect. In developing countries, however, the reality lags behind the theoretical trend. This type of education is costly and requires well-prepared teachers as well as workshops and laboratories. The trend will therefore only become a reality in such countries if a well-trained corps of teachers is available and if laboratory equipment can be largely produced within the country.

The problem of teachers is of particular significance. Two possibilities have been investigated—the retraining of science teachers and pedagogic training of craftsmen from the community. Both these solutions must be considered as transitory and it is essential that full teacher training in general technical education should be established.

Another aspect is curriculum development and the development of learning materials for general technical education. Valid results can only be achieved by fostering research in this area, which may also have a considerable impact on the teacher-training factor.

With regard to field projects, an interesting Unesco project in Singapore may be cited. Under this project, science teachers were retrained through crash programmes to become industrial arts teachers in woodwork, metalwork and basic electricity. Singapore today has a well-established general technical education using a system of centralized workshops. This is only one example and, at present, similar projects are being carried out under Unesco assistance in almost twenty different countries.

Under Unesco's Regular Programme, a Graphic Communication Course[1] was developed in 1980 for the education system at grades 7–9. The course consists of eighteen modules designed to be used on a self-learning basis, and is at present being tested in ten Member States. It is readily adaptable to local languages and conditions. The course promotes, in particular, communication through technical drawing, which is considered the language of technology and which has the advantage of being international.

In sum, it can be said that there is a fully integrated education system in industrialized countries while in developing countries the picture is quite different. Only a fraction of the age-group 12–15 enters or remains in the schools. A number of emergency programmes outside the school system have been created for these countries, including social service agencies to establish pre-vocational training programmes for a portion of those who are neither accepted in the education system nor able to find employment. A number of governments, however, have realized that a better way is to expand the education system so as to include everyone rather than to create a separate, second-hand system that may create social problems at a later stage.

As far as the education system is concerned, the introduction of technical studies at this level is mainly designed to serve an orientation purpose, and close co-operation is required between the education system and any guidance services that may exist outside the system. In fact, Recommendation No: 68 to the Ministries of Education concerning the relationship between education, training and employment, with particular reference to secondary education, its aims, structure and content (adopted by the International Conference on Education (ICE) at its thirty-fourth session) provides in paragraph 3 that '... the programme of guidance and information should become an integral part of school life, throughout the primary and secondary levels'. As mentioned in many of the case-studies, the guidance programme should also have a more practical component, and liaison with future employers through field visits, part-time secondment, etc. seems essential. The provision of adequate information for children of this age so as to equip them to make a realistic occupational choice is another important factor.

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1. *INFO TVE 6—Graphic Communication: A Proposed Technical Drawing Course for General Education*, Unesco, Paris, 1980. (Available from the Headquarters Section of Technical and Vocational Education.)

Integration at the second stage of the secondary level (age-group 16–19)

The situation of this age-group in the school system and outside is complex and much less progress was cited in the case-studies for this level. According to Unesco's *Revised Recommendation concerning Technical and Vocational Education*, paragraph 26:

> Premature and narrow specialization should be avoided: (a) in principle 15 should be considered the lower age limit for beginning specialization; (b) a period of common studies concerning basic knowledge and skills should be required for each broad occupational sector before a special branch is chosen.

It should also be noted that ages 16–19 represent a critical stage of development. Adolescence brings with it its own problems that make an occupational decision during this period even more difficult to reach.

In broad terms, this age-group can be divided into five categories:

1. Academic—from the higher classes of society, who may be more gifted and who are preparing for higher studies.
2. Technical and vocational students in full-time educational programmes, whether oriented towards industry, agriculture, commerce, etc., who have already made their occupational choice and who are therefore preparing for a middle-level occupation in their field.
3. School-leavers who enter into employment and receive training as skilled or semi-skilled workers. For practical purposes, these programmes are known as 'vocational training'.
4. School-leavers who find employment without training. Unfortunately, this group is by and large the most numerous and in quite a number of countries, in fact, represents nearly one-half of the age-group.
5. The unemployed, who are not only considered drop-outs from the educational system, but also from society. This is a major concern today as this group is also dangerously increasing.

As the title of the present publication indicates, the case-studies concentrate on efforts to integrate general education and technical and vocational education, and therefore usually cover groups 1, 2 and 3, while making very little mention of groups 4 and 5. Almost no success has yet been reported in bringing about the integration of all three groups, though it could perhaps be said that the Scandinavian countries have come close. The Finnish report clearly states that strong efforts will be made in the years ahead to establish a comprehensive school at upper-secondary level. In most countries, however, efforts for vocationalization of general secondary-level education are just beginning.

The major task lies in reforming secondary education so as to orient it towards the world of work rather than simply towards a preparation for entrance into higher education. It has therefore been fully recognized that curricula must be changed to reflect this dual function.

Often, as mentioned in the Australian case-study, students may choose between several options. The problems in implementing such programmes are formidable, in particular with regard to organization and facilities. Specialized workshops are costly and specialized staff not easily available. The concept of centralized workshops has gained ground. In this approach, a given number of specialities, for example, sixteen, are covered in the centralized workshop where students from five to eight different schools go for one to one and a half days per week for a vocational programme. Sometimes, block release is preferred.

Technical schools have also undergone changes and now provide more general education programmes.

In spring, 1980, Unesco organized an international symposium on the transition from technical and vocational schools to work, in which both industrialized and developing countries participated and which was held in Berlin, German Democratic Republic.[1] Participants had an opportunity to visit relevant educational establishments in the country. The high degree of integration between the school system and the economy was noted, as well as the large percentage of the age-group receiving a vocational qualification.

With the introduction of lifelong education (sometimes called 'career education'), it was deemed essential that technical education students should also have the possibility of entering higher education. For this reason, the general education component of the curricula took on a new importance. Discussions are under way as to what type of general education is best suited to these students, and many professionals consider that social skills (such as those needed when dealing with other people, both at work and in private life, for example, working as a member of a team, etc.) and life skills (skills required in daily life, for example, familiarity with public services, handling money, etc.) should play a more prominent role.

Preparation for an occupation within a school environment, however, has its limitations. Even the best simulation of work experience within a school environment cannot replace actual experience and it is for this reason that school systems are multiplying their efforts to organize work-study programmes or co-operative education programmes that alternate education with employment and training.

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[1] *The Transition from Technical and Vocational Schools to Work—Problems, Current Efforts and Innovative Approaches and Measures for Improving the Transition—A Summary Report of the Unesco International Symposium held in Berlin, German Democratic Republic, from 14–18 April 1980*, by Daniel B. Dunham.

A very interesting programme exists in the Netherlands system—the four-year Middle Technical Schools Programme for Lower Technicians in the age-group 15–19. The third year of this programme is completely spent in industry with close collaboration between the industry concerned and the educational institution. The programme consists of two years in school (technical education), one year in industry and the final year once again in school where the final examination is taken. The one year of practical experience gives the student an excellent idea of the reality of his future occupation and quite often he trains in what will eventually become his place of work. One of the difficulties involved in such systems, however, is to find sufficient places in industry. Industrial leaders with a sufficiently broad outlook to accept such programmes are also essential.

The complex legal and administrative aspects of such programmes largely contribute to create the major obstacles encountered in the integration of the groups mentioned above. The programmes are administered by different agencies, namely, the Ministry of Education in the case of group 2 in the series listed earlier and the Ministry of Labour for group 3. The products of non-formal training systems are not normally recognized by the education system and are therefore unable to re-enter that system. Attention should be drawn here to the traditional system, which is mentioned in the Austrian report and which also exists in other countries such as the Federal Republic of Germany, i.e. the 'dual system of vocational education and training'. This system is the joint responsibility of several (usually two) agencies: during the training periods which the trainee spends as an employee responsibility falls under the commerce. trade, industry organizations. During the apprenticeship contract, the trainee is also obliged to attend a vocational school that not only provides general education, but also supplements vocational training in theory and practice. This part of the system is supervised by the educational authorities. The organization of the school programme may involve day release, block release or sandwich programmes. To a certain extent, therefore, the dual system demonstrates a close integration of education and training.

Vocational training during employment is covered by two International Labour Organisation instruments—Recommendation No. 150 and Convention No. 142 concerning Vocational Guidance and Vocational Training in the Development of Human Resources. Article 2 of Convention No. 142 states:

> With the above ends in view, each Member shall establish and develop open, flexible and complementary systems of general, technical and vocational education, educational and vocational guidance and vocational training, whether these activities take place within the system of formal education or outside it.

Furthermore, paragraph 1(f) of the International Bureau of Education Recommendation No. 68, already mentioned, states that coherent action in education, training and empolyment should

> reorganize secondary education by breaking with its traditional academic emphasis, which is a source of élitism and segregation, and by associating in one balanced, harmonious and flexibly diversified system the general, technical and vocational processes of education that make up the individual training of the young and integrate them in society.

Technological development also requires personnel at an increasingly higher level together with greater job mobility. It is therefore of interest to employers to bring the education and training systems closer together.

In addition to organizational reforms for this purpose, there are also changes inside the systems that may lead to their integration.

In recent years, considerable progress has been made in respect of learning by objectives. Training systems in particular have succeeded in spelling out clear, measurable objectives and, on the educational side, there has been an improvement in the affective and psychomotor domains as well as the cognitive. Consequently, a more precise answer to the question 'education for what?' can be given right from the beginning, and a clearer evaluation can be made not only of the student's performance, but also that of the teachers and the system itself. The academic element in education is still less favourably inclined towards performance objectives although the trend clearly shows that more evidences should be made public which questions the efficiency of education as a whole.

It is therefore logical that educational research should have considerably increased in recent years, and it is in this area that close co-operation must exist between training, education and employment. A number of highly reputed research institutions have been operating for years past and have shown their capability with regard to curriculum development, evaluation techniques and the identification of economic and social needs.

At national level, many of these institutions also operate information services and conduct in-service teacher-training and managers' training programmes.

A computer-assisted international directory of research and teacher-training institutions has been published by Unesco.[1] Unesco is also, in its current programme, establishing an international information service for technical and vocational education.

With regard to research, it should likewise be noted that one country specifically mentioned the establishment of a tracer system of school-leavers in employment. Data obtained from this kind of follow-up system is imperative for improving programmes, making job analyses, etc.

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[1] *International Directory of Selected Research and Teacher Training Institutions in the Field of Technical and Vocational Education*, Paris, Unesco, 1980.

A close association of research and teacher training must be instituted so that up-to-date methods may be used in the future for technical teacher training. With this in mind, a number of operational projects assisted by Unesco have developed self-learning packages or modules that will make it possible in the future to bring pre-and in-service technical teacher training closer together. Many of these modules can easily be used for instructor training, for the retraining of general education teachers as technical teachers, or to provide newly recruited craftsmen or technicians from industry with a minimum body of teaching skills.

Integration, in terms of content, also means integrating theory and practice. It is sometimes difficult to make this a reality because of a lack of competent staff. It has already proved detrimental to have two separate types of teachers—some for theory and others for workshops, with the theory teachers being unjustly granted a higher social status and even a higher salary.

The close association of theory and practice should also be taken into consideration in planning school facilities, workshops and laboratories. In this context, project work has proved to be a particularly useful approach. The utility of selecting projects in the light of their educational and economic value has become a primary consideration in developing countries and, as a result, this method has been increasingly recognized by Member States. Unesco's current programme[1] places a strong emphasis on education and productive work and the 1981 Conference of the International Bureau of Education gave primary emphasis to precisely that problem. Productive work can also be introduced into teacher-training programmes in the form of production units.

As already noted very little mention has been made in the case-studies of groups outside the educational and training systems—group 4 above, those going into employment with no training, and group 5, unemployed youth, which may also include people who become unemployed after a short initial period in employment. An interesting programme is reported by the United States under the Comprehensive Employment and Training Act (CETA) for the more disadvantaged groups. It should be added that many other governments have made efforts in the same direction. For example, the United Kingdom has recently initiated two programmes for the unemployed aged 16–18 and provides an integrated education and training programme under the Youth Opportunity Programme (YOP), while an experimental programme was launched in July 1976 called Unified Vocational Preparation (UVP). Both of these programmes require close co-operation between the educational and training authorities and employment services.

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[1] *Approved Programme and Budget 21C/5*, paragraph 1368, Paris, Unesco, 1981.

While the present study focuses on the age-group 12–19, lifelong education cannot ignore essential reforms in adult education. Advances in technology have emphasized retraining and the updating of programmes, but it has now been fully realized that the integration of general and technical and vocational education is an equally important requirement for adult education. A high percentage of those who lose their jobs do so not through a lack of technical skills but from a lack of social skills. The trend for all employees to participate in management decisions now gives another dimension to adult education. Unesco's Recommendation on the Development of Adult Education, adopted in 1976, makes the appropriate provisions.

The major problem here is the lack of adequate facilities and staff, and it is therefore quite logical to devote more consideration to the use of existing school facilities for adult education in an integrated manner. Demographic movements affecting the school population can provide opportunities in this way. For example, the decline of the school population by a high percentage may result in unused school facilities and staff, which could then be utilized for other purposes.

Adult education is also increasingly utilizing methods other than the conventional ones, for example, distance learning. Here again a significant problem is the lack of full recognition of achievement, such as may be obtained not only in organized learning but also in learning on the job.

In summary, the following five points on the problem of integration of general and technical and vocational education may be highlighted:

1. A comprehensive secondary education system has not yet become a reality and the situation at this level is not likely to improve in the near future. The present system still compartmentalizes students into major groups and often does not allow for what legislation promises in theory—equal educational opportunity and access for all. This system also lacks the efficient guidance services that should be an integral part of education. As many different agencies will have to participate in the establishment of a truly comprehensive secondary education system, co-operation and co-ordination will be a primary prerequisite in this area.
2. Education, whether carried out in the general education system, in vocational education or in training in a non-formal way, needs to improve standards for the recognition of achievement in order to ensure a more just evaluation of knowledge, skills and attitudes.
3. Educators will have to recognize that learning is not an activity which is limited to the schools, but rather one which occurs to a large degree outside the education system, i.e. in the family and in employment. The concept of 'learning while earning' seems in this sense a reasonable approach. It should also be noted that the broadening availability of technological facilities (television, computers, etc.) will play a more important role in the future for informal learning.

4. The values and objectives of education will have to be reviewed and new criteria and priorities set with a view to increasing the relevance of education to modern society. Continuous research in curriculum development on a scientific basis will therefore be a primary condition for finding a solution to the problem of integration of general and technical and vocational education and training.
5. Only a corps of dedicated teachers and educators and capable administrators and supervisors who are sufficiently open-minded to the needs of the future will be able to make the necessary reforms a reality.

Appendices

Appendix I
Guidelines for writing case-studies on the integration of general education and technical and vocational education at the secondary level

Introduction

According to Unesco's Approved Programme and Budget for 1979–1980, 20C/5, paragraph 1131, an international study will be carried out on the integration of general education and technical and vocational education at secondary level. The study will be based on individual case-studies reflecting existing situations in ten or twelve selected Member States and will be published in the series 'Trends and Issues in Technical and Vocational Education'. The study will present an overall picture of the integration of general education and technical education at secondary level—the extent to which it exists, its nature and objectives, current policy trends in this direction, etc.

In order to allow for a better comparison of the case-studies, the attached guidelines have been established to assist the authors in their work. The following comments and suggestions are offered regarding the guidelines:

a. It would seem essential that the case-study be prepared through some form of close collaboration or, at least, consultation, between those responsible at the secondary level for general education and for technical and vocational education; an item at the end of the guidelines asks for an indication of the manner in which the case-study was formulated.
b. Because the problem of terminology in technical and vocational education creates problems in comparative studies, international terms should be used as much as possible, indicating in parentheses the terms actually used in your country if these are different.[1]
c. The guidelines distinguish between the first and second 'stages' of secondary education in order to ascertain whether policies and practices are different at these two stages; these stages correspond approximately to the age-groups of 12–15 years and 16–19 years, respectively. If the stages of secondary education in your country do not correspond to these two age-ranges, describe them in terms of your system, trying however to cover in some way the total range from 12 to 19 years.
d. Almost all of the items of the guidelines apply most readily to formal edu-

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[1] Under the IBEDATA series, a *Terminology of Technical and Vocational Education* was published in 1978 in English and French.

cation, but there is no intention to exclude any instances where provisions for non-formal education provide for the integration of general education and technical and vocational education; such instances should be described according to the appropriate items of the guidelines.

e. The guidelines make no explicit provision for reporting on any integration of general education and technical and vocational education that may exist at the pre-secondary level; if it exists in your country, please describe accordingly.

f. For purposes of the comparative analysis of the case-studies from the various countries, it will be important that each study be structured in a manner which follows as nearly as possible the framework of the guidelines.

The case-study should be submitted to:

Director
Division of Science, Technical
and Vocational Education
Unesco
7 place de Fontenoy
75700 Paris
France

1. Profile of second-level education

1.1 Please describe and illustrate graphically the structure of the educational system, indicating the articulation between stages of schooling and between school and work and, where possible, the relationship between in-school and out-of-school programmes. Please find attached a sample of such a diagram (Fig. 1). The same symbols should be used, if this is possible. Indicate the points at which selection by examination takes place and institutional separation, should this exist, between general education and technical and vocational education.

1.2 Please describe secondary-level enrolment, providing, where possible, statistics on, for example, percentage of the total age-group enrolled in secondary educational institutions, the breakdown of enrolment into various types of programmes (university preparation, general, technical and vocational), percentage of those completing secondary education who continue in third-level programmes, etc. Please include throughout percentage ratios of girls to boys and of students to teachers.

1.3 Provide a diagram, a sample of which is attached (Fig. 2), accompanied by an explanation, of the structures of the educational administration, indicating clearly where responsibility lies for general education and for technical and vocational education and indicating lines of co-ordination or co-ordinating bodies (councils, boards) which link the two. Please include bodies which co-ordinate education and employment.

1.4 Give an indication of the financial situation and what proportion of the educational budget has been allocated to technical and vocational education. It would also be of interest to see the comparison of cost per student in general, in technical and vocational education and in non-formal training systems.

2. Policy of secondary education: its formulation and trends

2.1 State the official policy on secondary education in your country, with emphasis on the integration of general education and technical and vocational education, and its underlying philosophy. Describe briefly the mechanism for formulating educational legislation.

2.2 Describe any major changes in policy in the last ten years and indicate whether any trends for the future can be identified.

2.3 Describe actions taken on the following major issues (if applicable to your country):

2.3.1 Adjustment of the educational system to the economic needs of the country (manpower requirements).

2.3.2 Improvement of social aspects of education.

a) Youth unemployment.
b) School drop-outs.
c) Educational opportunities for early school-leavers.
d) Changing attitudes towards educational certification.
e) Improving the situation of disadvantaged groups e.g. children of migrant workers, etc.

2.3.3 Improvement of democratization, e.g. equal opportunities, access of girls to technical and vocational education.

2.3.4 Reform of the examination system e.g. introduction of a credit system (objective testing, etc.).

2.4 Indication of strategy taken to implement reforms in secondary education towards more integration, with reference to public awareness, research, experimentation, policy formulation, planning, organization and evaluation.

3. Integration at the first stage of the secondary level

(Age group 12–15 years)
Please comment on the following topics:

3.1 Refer to the diagram which shows educational structures, giving a general description of the first stage of secondary-level education including the age-group concerned, the institutional organization (e.g. comprehensive or separate institutions), the age at which compulsory education, if it exists, ends, whether or not there is a process of selection at this stage and the nature of this process of selection, etc.

3.2 The curriculum in general, indicating:

a) required and elective subjects and any differences between curricula and subjects offered to and required of girls and boys;
b) ways, if any, in which general subjects and technical and vocational subjects are related to one another, etc.

A sample of a curriculum outline can be found in Table 1.

3.3 The objectives, organization and content of technical and vocational subjects at this level. Please provide a diagram similar to the sample shown as Figure 3, and indicate also to what extent theory and practice are integrated.

3.4 Methods of educational materials used for technical and vocational subjects at this level.

3.5 Availability and organization of physical facilities, including workshops and laboratories, with special reference to standardization and local production of equipment.

3.6 Please describe any differences between rural and urban areas in the content and implementation of curricula in general and in technical and vocational subjects.

3.7 Teacher qualifications and training, including discussion of:

3.7.1 Ways, if any, in which general teacher training and technical teacher training are related.

3.7.2 Objectives, organization, content and methods of in-service training programmes, including re-training of teachers.

3.7.3 Differences, if any, between the qualifications and status of general teachers and those of technical and vocational teachers.

3.8 Describe projects in educational and vocational guidance offered at this stage, including guidance staff, facilities and materials.

3.9 The nature of selection procedures either during this stage of secondary education or at its end which determine promotion and type of programme to be followed by students.

3.10 Describe in detail any recent innovations or planned reforms concerning any or all of the above points, noting the results obtained or expected, the problems confronted in implementing these reforms and the steps taken to solve them.

4. Integration at the second stage of the secondary level

(Age-group 16–19 years)

Please provide information on the following topics:

4.1 With reference to the structural diagram, provide a general description, including the types of organization of this stage (comprehensive or specialized institutions, etc.), sex and age of the group concerned, the criteria for selecting students for various programmes and/or institutions, the proportion of students enrolled in general programmes and the proportion of those in general programmes taking technical or vocational subjects. Please also indicate the age at which compulsory education, if it exists, ends.

4.2 Curricula with particular emphasis on the following points:

4.2.1 The extent to which technical and vocational subjects or activities are a required component of the curriculum for all students, whether preparing for higher studies or for employment. (Compulsory or optional.)

4.2.2 Extent to which curriculum development is carried out in collaboration with governmental or non-governmental agencies concerned as listed in paragraph 12 of Unesco's Revised Recommendation concerning Technical and Vocational Education. [See Appendix II.]

4.2.3 The objectives, organization and content of technical and vocational subjects and programmes at each level, including proportion of practical to theoretical work. Please refer to Table 1, which gives a sample of a curriculum outline and to the graphic analysis in Figure 3.

4.2.4 Mechanisms of adapting curricula to changing circumstances.

4.2.5 Availability and types of work-study programmes. (Alternating periods of study in schools or centres with employment experience educationally recognized.) This should also include apprenticeship systems, if any.

4.3 Types of educational materials and methods used for technical and vocational programmes and subjects. Describe any innovations in methods used for improving students' participation in technical and vocational studies, for instance, self-learning packages, module systems based on behavioural objectives, project work, etc. with special reference to standardization and local production of materials.

4.4 Availability and organization of physical facilities, including workshops and laboratories, with particular emphasis on:

4.4 a) planning for maximum utilization of facilities, and

b) to what extent workshops for learning technical and manual skills can be used for production of educational equipment, e.g. equipment for school workshops at the first stage of secondary education.

4.5 Any differences between rural and urban areas in the content and implementation of curricula in general and technical and vocational programmes in particular.

4.6 Teacher qualification and training, including discussion of:

4.6.1 Ways, if any, in which general teacher training and technical teacher training are related.

4.6.2 Objectives, organization, content and methods of in-service training programmes, including re-training of teachers.

4.6.3 Differences, if any, between the qualifications and status of general teachers and those of technical and vocational teachers.

4.6.4 Continuing teacher training and possible seconding to industry.

4.6.5 Describe any additional personnel required for this level, including supervisors, administrators, etc.

4.7 The availability and nature of educational and/or occupational guidance offered at this stage, including guidance staff, facilities, and materials available.

4.8 Nature of selection procedures at completion of this stage which determine whether the student pursues higher studies or seeks employment, dealing, for example, with such points as:

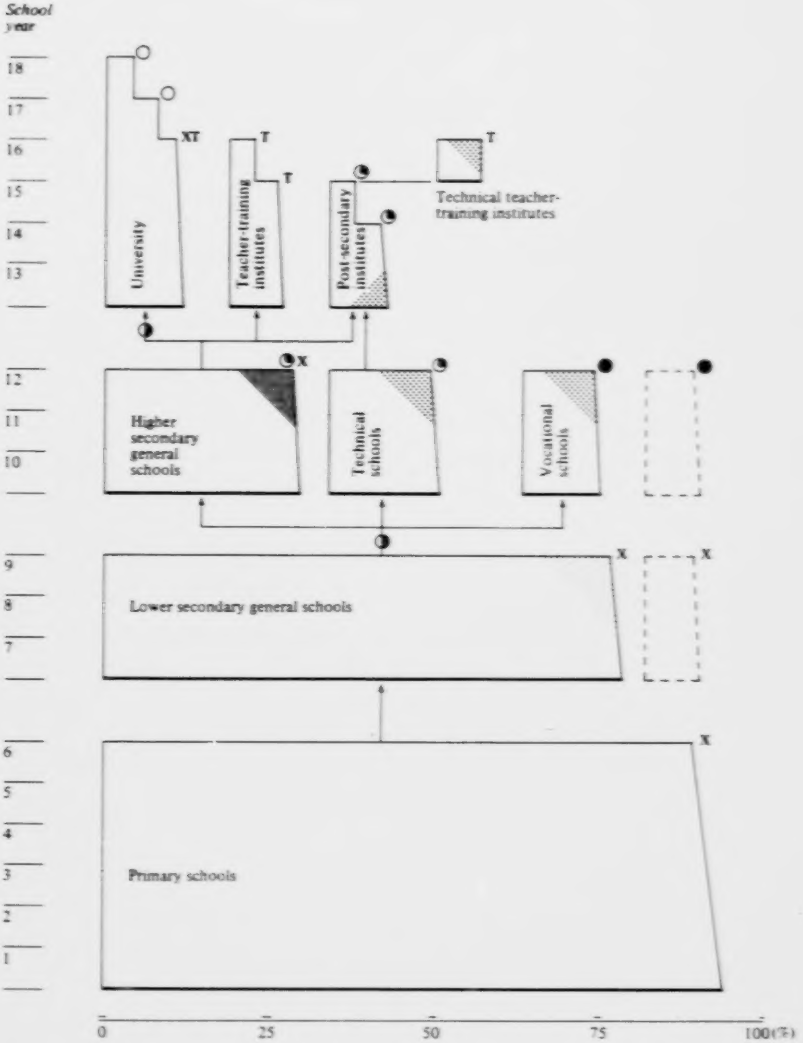
School year
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
XT
T
T
T
X
X
X
X
University
Teacher-training institutes
Post-secondary institutes
Technical teacher-training institutes
Higher secondary general schools
Technical schools
Vocational schools
Lower secondary general schools
Primary schools
0
25
50
75
100(%)

FIG. 1. An example of an overall diagram of a national educational system with special reference to the place of technical and vocational education.

☐	*Indicates separate categories of institutions within the education system*
◹	*Indicates presence of technical and vocational subjects within the general education curriculum*
◥	*Indicates comprehensive institutions*
▨	*Indicates institutions exclusively for technical and vocational education*
⬚	*Indicates institutions for technical and vocational education outside the formal education system*
→	*Indicates normal routes through the system*
⇢	*Indicates second or unusual routes through the system*
◑	*Indicates examinations required to obtain recognition of successful completion of one level of education before proceeding to the next level*
○	*Engineering or professional qualification*
◔	*Technician or middle-level qualification*
●	*Skilled worker or craftsman qualification*
T	*Teacher qualification*
X	*No qualification*

Key to Figure 1

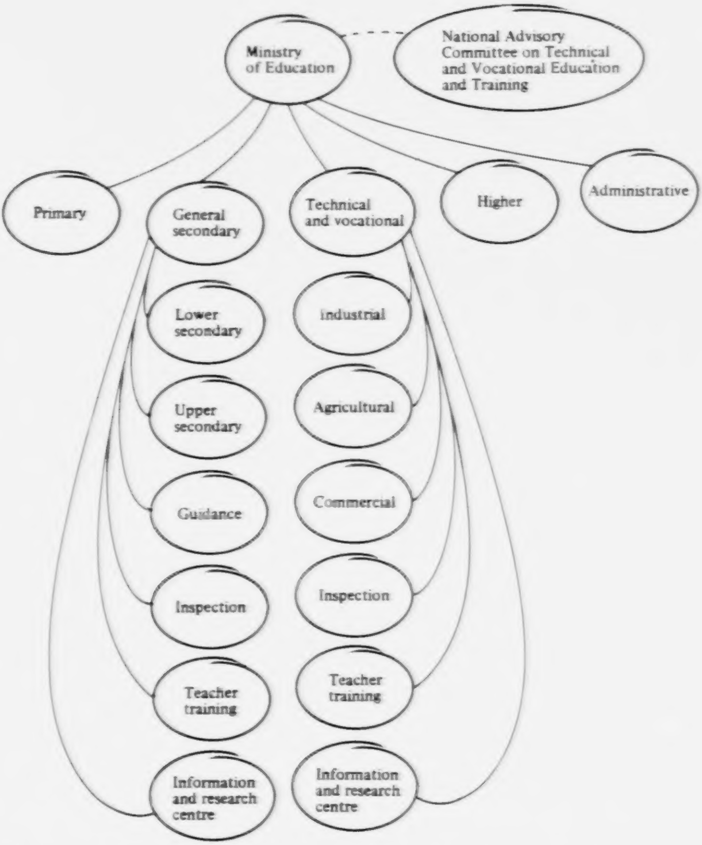
Ministry of Education
National Advisory Committee on Technical and Vocational Education and Training
Primary
General secondary
Technical and vocational
Higher
Administrative
Lower secondary
Upper secondary
Guidance
Inspection
Teacher training
Information and research centre
Industrial
Agricultural
Commercial
Inspection
Teacher training
Information and research centre

FIG. 2. An example of a diagram of a fictitious administrative structure of an educational system, showing details on secondary education. Please provide more diagrams for federal systems or separate ministries of education, if they exist.

Grades: 10–11–12

Periods per week:
44 44 44

Country:

Type of school: Vocational

Speciality: Auto-mechanics

Entrance requirement: 9 years

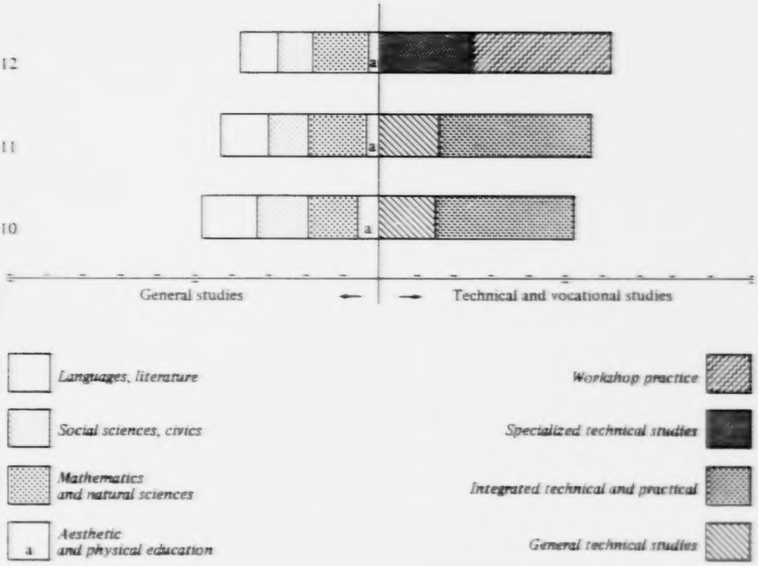

FIG. 3. Sample of curriculum outline with diagram.

4.8.1 Examinations, and their importance in the determination of what the student will do.

4.8.2 Entrance requirements to higher education, and whether work experience is accepted as credit or required for such entrance.

5. Transition between school and work

Please describe in detail the measures taken or planned which are designed to ease the transition between school (whether general or specialized) and work, and the results obtained. These might include the following:

5.1 Mechanism of occupational guidance and placement and how educational institutions and employment are related.

5.2 Mechanism providing a guided employment experience for young people at completion of secondary education and prior to regular employment or further studies.

5.3 Measures taken to improve relations between schools and employment.

5.4 Efforts to experiment with measures to facilitate transition; e.g. educational measurement for credit systems which allows interchangeability between education and employment.

6. Conclusion

Please include in the conclusion any aspects you feel have not been covered in the above questionnaire regarding the integration of general and technical and vocational education, and give some indication of the need for international co-operation in this regard. Please indicate:

6.1 What major projects have been carried out under bilateral or multilateral assistance and add also any problems such projects may have raised.

6.2 Indicate whether in your country there are differences between established educational policies and the training policies of national and transnational industries or commercial enterprises.

6.3 Please provide information on the need for more information at international level, in what type of information you are interested, and if you have the mechanism to use this information efficiently.

Appendix II
Revised Recommendation concerning Technical and Vocational Education[1]

The General Conference of the United Nations Educational, Scientific and Cultural Organization, meeting in Paris, at its eighteenth session, held from 17 October to 23 November 1974,

Recalling the constitutional responsibilities of the Organization for the promotion of education,

Recognizing that technical and vocational education have to contribute to the maintenance of peace and friendly understanding between the various nations,

Considering that education must now be seen as a lifelong process,

Recognizing that technical and vocational education is a prerequisite for sustaining the complex structure of modern civilization and economic and social development,

Recalling the principles set forth in Articles 23 and 26 of the Universal Declaration of Human Rights guaranteeing all the right to work and to education,

Considering therefore that all have a right to an education enabling full participation in contemporary society,

Taking into account the diversity of education systems throughout the world, as well as the particular and urgent needs of developing countries,

Considering that in spite of this diversity similar goals are pursued and similar questions and problems arise in all countries concerning technical and vocational education and that therefore common standards and measures are called for,

Having adopted for this purpose at its twelfth session the Recommendation concerning Technical and Vocational Education,

Recognizing however that the rapid technological and educational changes of the last decade require new, creative, and efficient efforts in technical and vocational education to improve education as a whole for social, economic and cultural development,

Having decided at its seventeenth session that in view of these changes this Recommendation should be revised in order to better serve Member States,

Noting that the International Labour Conference has adopted, over the years, a number of instruments dealing with various aspects of vocational guidance

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1. Adopted by the General Conference of Unesco at its eighteenth session, Paris, 19 November 1974.

and vocational training and, in particular, the Vocational Guidance Recommendation, 1949, the Vocational Training (Agriculture) Recommendation, 1956, and the Vocational Training Recommendation, 1962, and that the Conference, at its 59th session, had adopted substantive conclusions with a view to adoption, in 1975, of a new instrument or instruments on vocational guidance and vocational training,

Noting further the close collaboration between Unesco and the International Labour Organisation (ILO) in drawing up their respective instruments so that they pursue harmonious objectives, avoiding duplication and conflict, and with a view to continued collaboration for effective implementation of the two instruments,

Adopts this Recommendation this nineteenth day of November 1974,

The General Conference recommends that when developing and improving technical and vocational education, Member States should apply the following provisions by taking whatever legislative or other steps may be required to give effect, within their respective territories, to the principles set forth in this Recommendation,

The General Conference recommends that Member States should bring this Recommendation to the knowledge of the authorities and bodies concerned with technical and vocational education,

The General Conference recommends that Member States should report to it, at such times and in such manner as shall be determined by it, on the action they have taken to give effect to the Recommendation.

I. Scope

1. This Recommendation applies to all forms and aspects of education which are technical and vocational in nature provided either in educational institutions or under their authority, directly by public authorities, or through other forms of organized education, public or private.
2. For the purposes of this Recommendation: 'technical and vocational education' is used as a comprehensive term referring to those aspects of the educational process involving, in addition to general education, the study of technologies and related sciences and the acquisition of practical skills, attitudes, understanding and knowledge relating to occupations in various sectors of economic and social life. Technical and vocational education is further understood to be:
   (a) an integral part of general education;
   (b) a means of preparing for an occupational field;
   (c) an aspect of continuing education.
3. Technical and vocational education, being part of the total educational process, is included in the term 'education' as defined in the Convention and Recommendation against Discrimination in Education adopted by the General Conference of the United Nations Educational, Scientific and Cultural Organization at its eleventh session and the provisions of that Convention and Recommendation are therefore applicable to it.
4. This recommendation should be understood as setting forth general principles, goals and guidelines to be applied by each individual country according to needs and resources. The application of the provisions in their

Table 1. An example of a curriculum outline. Country: ________. School type: ________
Level/grade: ________. Section: ________. Specialty: ________.

Subject group	Subjects	Periods weekly									
		1st year			2nd year			3rd year			
		Class	Lab.	Workshop	Class	Lab.	Workshop	Class	Lab.	Workshop	Total
General	Civics/social st.										
	Native language										
	Foreign lang. (tech.)										
	Commercial st.										
	Physical ed.										
Basic science	Mathematics										
	Applied physics										
	Applied chemistry										
	Eng. sciences										
General technical	Tech. drawing										
	General technology										
	Mech. technology										
	Elect. technology										
	Constr. technology										
	Techn. calculation										
Special technical											
	Tech. reporting										
Total classroom periods											
Total lab. periods											
Total workshop periods											
Total practice											
Grand total per week											

particulars and the timing of the implementation will therefore depend upon the conditions existing in a given country.

II. Technical and vocational education in relation to the educational process: objectives

5. Given immense scientific and technological development, either in progress or envisaged, which characterizes the present era, technical and vocational education should be a vital aspect of the educational process and in

particular should:

(a) contribute to the achievement of society's goals of greater democratization and social, cultural and economic development, while at the same time developing the potential of individuals for active participation in the establishment and implementation of these goals;

(b) lead to an understanding of the scientific and technological aspects of contemporary civilization in such a way that men comprehend their environment and are capable of acting upon it while taking a critical view of the social, political and environmental implications of scientific and technological change.

6. Given the necessity for new relationships between education, working life, and the community as a whole, technical and vocational education should exist as part of a system of lifelong education adapted to the needs of each particular country. This system should be directed to:

(a) abolishing barriers between levels and areas of education, between education and employment, and between school and society through: (i) the integration of technical and vocational and general education in all educational streams above primary level; (ii) the creation of open and flexible educational structures; (iii) the taking into account of individuals' educational needs and of the evolution of occupations and jobs;

(b) improving the quality of life by permitting the individual to expand his intellectual horizons and to acquire and to constantly improve professional skills and knowledge while allowing society to utilize the fruits of economic and technological change for the general welfare.

7. Technical and vocational education should begin with a broad basic vocational education, thus facilitating horizontal and vertical articulation within the education system and between school and employment thus contributing to the elimination of all forms of discrimination and should be designed so that it:

(a) is an integral part of everyone's basic general education in the form of initiation to technology and to the world of work;

(b) may be freely and positively chosen as the means by which one develops talents, interests and skills leading to an occupation in the sectors listed in paragraph 2 or to further education;

(c) allows access to other aspects and areas of education at all levels by being grounded on a solid general education and, as a result of the integration mentioned in paragraph 6(a), containing a general education component through all stages of specialization;

(d) allows transfers from one field to another within technical and vocational education;

(e) is readily available to all and for all appropriate types of specialization, within and outside formal education systems, and in conjunction or in parallel with training in order to permit education, career and job mobility at a minimum age at which the general basic education is considered to have been acquired, according to the education system in force in each country;

(f) is available on the above terms and on a basis of equality to women as well as men;

(g) is available to disadvantaged and handicapped persons in special forms adapted to their needs in order to integrate them more easily into society.

8. In terms of the needs and aspirations of individuals, technical and vocational education should:
   (a) permit the harmonious development of personality and character and foster the spiritual and human values, the capacity for understanding, judgement, critical thinking and self-expression;
   (b) prepare the individual to learn continuously by developing the necessary mental tools, practical skills and attitudes;
   (c) develop capacities for decision-making and the qualities necessary for active and intelligent participation, teamwork and leadership at work and in the community as a whole.

III. Policy, planning and administration

9. Policy should be formulated and technical and vocational education administered in support of the general objectives adopted for the educational process as well as for national and, if possible, regional social and economic requirements, and an appropriate legislative and financial framework adopted. Policy should be directed to both the structural and the qualitative improvement of technical and vocational education.

10. Particular attention should be given to planning the development and expansion of technical and vocational education:
    (a) high priority should be placed on technical and vocational education in national development plans as well as in plans for educational reform;
    (b) planning should be based upon a thorough evaluation of both short-term and long-term needs taking into consideration any variation in needs which may exist within a country;
    (c) adequate provision for proper current and future allocation of financial resources should be a major element of planning;
    (d) planning should be done by a responsible body or bodies having authority on the national level. This body should have available to it data which have been collated, analysed, synthesized and interpreted by qualified staff provided with adequate research facilities.

11. Planning should be responsive to national and, if possible, regional, economic and social trends, to projected changes in demand for different classes by goods and services, and for different types of skills and knowledge in such a way that technical and vocational education may easily adapt to the evolving situation be it rural or urban. This planning should also be co-ordinated with current and projected training action and the evolution of employment.

12. While the education authorities should have primary responsibility, the following groups and authorities should be actively associated in policy formulation, and in the planning process. Structures, on both national and local levels, taking the form of public agencies or consultative or advisory bodies, should be created to permit this:
    (a) public authorities responsible for planning economic and social policy,

labour and employment, and for the various occupational sectors (industry, agriculture, commerce);

(b) representatives of non-governmental organizations within each occupation sector from among employers and workers;

(c) any authority or body, such as a training body or extension services, responsible for out-of-school education and training;

(d) representatives of those responsible—both in public education and in State recognized private education—for executing educational policy including teachers, examining bodies and administrators;

(e) parent, former pupil, student and youth organizations;

(f) representatives from the community at large.

13. Policies for the structural improvement of technical and vocational education should be established within the framework of broad policies designed to implement the principle of lifelong education through the creation of open, flexible and complementary structures for education, training and educational and vocational guidance, regardless of whether these activities take place within the system of formal education or outside it. In this respect cosnsideration should be given to the following:

(a) multipurpose secondary education offering diversified curricula including work-study programmes;

(b) open tertiary institutions recruiting from a variety of sources and offering programmes ranging from short specialized ones to longer full-time programmes of integrated studies and professional specialization;

(c) establishing a system of equivalences whereby credit is given for completion of any approved programme and recognition is granted of educational and professional qualifications achieved through various means.

14. Policy should be directed to ensuring high quality in such a way as to exclude the possibility of any judgement which discriminates between the different educational streams, whatever their ultimate goal. In this respect special efforts should be made to ensure that technical and vocational education in rural areas meets the same standards as that offered in urban ones.

15. In order to ensure quality, responsible national authorities should establish certain criteria and standards, subject to periodic review and evaluation, applying in all aspects of technical and vocational education, including to the extent possible non-formal education for:

(a) all forms of recognition of achievement and consequent qualification;

(b) staff qualifications;

(c) ratios of teaching and training staff to learners;

(d) the quality of curricula and teaching materials;

(e) safety precautions for all learning environments;

(f) physical facilities, building, workshop layouts, quality and type of equipment.

16. Policies should be established fostering research related to technical and vocational education, with particular emphasis on its potential within lifelong education, and directed to its improvement. This research should be carried out by competent staff on national and institutional levels as well as through individual initiative. To this end:

- (a) special emphasis should be placed on curriculum development, research concerning teaching and learning methods and materials, and where the need exists, on technologies and techniques applied to development problems;
- (b) financial resources and physical facilities should be made available through institutions of higher education, specialized research institutions and professional organizations for applying the results of this research on an experimental basis in representatively selected institutions for technical and vocational education;
- (c) channels should be created for the widespread dissemination and rapid application of the positive results of research and experimentation;
- (d) the effectiveness of technical and vocational education should be evaluated using, among other data, relevant statistics including those concerning part-time enrolments and drop-out rates which are in some cases neglected;
- (e) particular attention should be given to all research efforts to humanize working conditions.

17. Provision should be made within administrative structures for evaluation, supervisory and accreditation services, staffed by technical and vocational education specialists, to ensure the rapid application of new research findings and to maintain standards:
    - (a) evaluation services as a whole should ensure the quality and smooth operation of technical and vocational education by continuous review and action directed to constant improvement of staff, facilities and programmes;
    - (b) supervisory services for the staff should encourage improvement in the quality of teaching by providing guidance and advice and recommending continuing education;
    - (c) all programmes of technical and vocational education, in particular those offered by private bodies, should be subject to approval by the public authorities through some means of accreditation or form of public inspection.

18. Particular attention should be given to the material resources required for technical and vocational education. Priorities should be carefully established with due regard for immediate needs and the probable directions of future expansion and adequate cost controls introduced:
    - (a) institutional planning should be directed to ensuring maximum efficiency and flexibility in use;
    - (b) the planning, construction and equipping of facilities should be carried out in collaboration with specialist teachers and educational architects and with due regard for their purpose, prevailing local factors and relevant reasearch;
    - (c) adequate funds should be allocated for recurrent expenditure for supplies and maintenance and repair of equipment.

IV. Technical and vocational aspects of general education

19. An initiation to technology and to the world of work should be an essential component of general education without which this education is incomplete. An understanding of the technological facet of modern culture in

both its positive and negative attributes, and an appreciation of work requiring practical skills should thereby be acquired. This initiation should further be a major concern in educational reform and change with a view to greater democratization of education. It should be a required element in the curriculum, beginning in primary education and continuing through the early years of secondary education.

20. Opportunities for general technical and vocational initiation should continue to be available to those who wish to avail themselves of it within the educational system and outside it in places of work or community centres.

21. The technical and vocational initiation in the general education of youth should fulfil the educational requirements of all ranges of interest and ability. It should mainly perform three functions:
    (a) to enlarge educational horizons by serving as an introduction to the world of work and the world of technology and its products through the exploration of materials, tools, techniques and the process of production, distribution and management as a whole, and to broaden the learning process through practical experience;
    (b) to orient those with the interest and ability towards technical and vocational education as preparation for an occupational field or towards training outside the formal education system;
    (c) to promote in those who will leave formal education at whatever level but with no specific occupational aims or skills, attitudes of mind and ways of thought likely to enhance their aptitudes and potential, to facilitate the choice of an occupation and access to a first job, and to permit them to continue their vocational training and personal education.

22. Required general technical and vocational studies in the schools having great importance for the orientation and education of youth programmes, should include a proper balance between theoretical and practical work. A properly structured programme of such studies should be drawn up by the competent authorities in collaboration with the professional community and with those responsible for technical and vocational education. These programmes should:
    (a) be based upon a problem-solving and experimental approach and involve experience in planning methods and decision-making;
    (b) introduce the learner to a broad spectrum of technological fields and at the same time to productive work situations;
    (c) develop a certain command of valuable practical skills such as tool use, repair and maintenance and safety procedures, whether applicable to future education, training and employment or to leisure time, and a respect for their value;
    (d) develop an appreciation of good design and craftsmanship and the ability to select goods on the basis of their quality;
    (e) develop the ability to communicate including the use of graphical means;
    (f) develop the ability to measure and calculate accurately;
    (g) be closely related to the local environment without, however, being limited to it.

23. The technical and vocational initiation in programmes of general edu-

cational enrichment for older youth and adults should be directed to enabling those engaged in working life to:

(a) understand the general implications of technical change, its impact on their professional and private lives, and how man may shape this change;

(b) to use practical skills for improving the home and community environment and thus the quality of life and, in appropriate conditions, for productive leisure-time activities.

V. Technical and vocational education as preparation for an occupational field

24. Given disparities that may exist between formal education, whether secondary or tertiary, and the employment and career opportunities available, the highest priority should be given to technical and vocational education which prepares young people to exercise occupations in the sectors covered by this recommendation. Consequently the structure and content of traditional education, whether general or technical and vocational, should be adapted accordingly through:

(a) the diversification of secondary education in the later stages so that it may be pursued in conjunction with employment or training, or may lead to employment or to higher education, thereby offering to all youth educational options corresponding to their needs;

(b) the introduction of new programmes into tertiary education more relevant to the career needs of young adults;

(c) the development of educational structures and programmes on all levels centred on organized and flexible interchange between educational institutions including training institutions and those responsible for employment in the various occupational sectors.

25. Technical and vocational education as preparation for an occupational field should provide the foundation for productive and satisfying careers and should:

(a) lead to the acquisition of broad knowledge and basic skills applicable to a number of occupations within a given field so that the individual is not limited by his education in his freedom of occupational choice, and later transfer from one field to another in the course of working life is facilitated;

(b) at the same time offer a thorough and specialized preparation for initial employment and effective training within employment;

(c) provide the background in terms of skills, knowledge and attitudes, for continuing education at any point in the individual's working life.

26. Premature and narrow specialization should be avoided:

(a) in principle 15 should be considered the lower age limit for beginning specialization;

(b) a period of common studies concerning basic knowledge and skills should be required for each broad occupational sector before a special branch is chosen.

27. Because it is desirable that women seek wider participation in all kinds of occupations outside family and domestic activities, they should have the same educational opportunities available to them as men in order to

prepare for an occupation and should be encouraged to take advantage of these through appropriate legislative measures and widespread distribution of information concerning these opportunities.

28. Special provision should be made for out-of-school and unemployed youth and children of migrant workers with the minimum or less of primary education, as well as for those not entering education or training programmes after completion of compulsory schooling, in order that they may acquire employable skills.
29. Given the necessity of integrating the physically and mentally disadvantaged into society and its occupations, the same educational opportunities should be available to them as to the non-handicapped in order that they may achieve qualification for an occupation; special measures or special institutions may be required.

Organization

30. Technical and vocational education as preparation for an occupational field should be organized on a national or, if possible, regional basis, so as to respond positively to over-all social, economic and educational requirements and to the needs of different groups of the population without discrimination.
31. Several organizational patterns of technical and vocational education, including both full-time and part-time options should exist within each country. The following patterns of organization for example should be considered:
    (a) full-time including practical training as well as general education, provided in an educational establishment, either comprehensive or specialized;
    (b) part-time programmes such as the following in which general education and theoretical and broad practical aspects of the occupational field are given in an educational establishment while specialized practical training is acquired during work in the chosen occupation: (i) the day-release system providing for young workers and apprentices to attend an educational establishment at least one day a week and preferably two; (ii) the sandwich system under which periods in an educational institution alternate with training periods in a factory, farm, business establishment or other undertaking; (iii) the block-release system whereby young workers are released to attend courses for one or two short periods of at least ten to fifteen weeks in total length per year which may be especially adapted to conditions in areas of low population density by provision of boarding facilities.
32. The responsible authorities should encourage part-time education, therefore:
    (a) these programmes should be available directly after completion of minimum compulsory or required schooling, and should continue to be available to the highest level of formal education;
    (b) the educational qualifications acquired by this means should be equivalent to those acquired by full-time education;
    (c) where employers are responsible for the practical training aspect for part-time students, this training should be as broad as possible serving

the educational and training needs of the individual, and should meet national standards.

33. In view of the increasing requirement for highly qualified middle-level manpower in all fields, and the increasing numbers completing secondary education or its equivalent, the development of programmes of technical and vocational education corresponding to further qualifying tertiary education should be given high priority. The following patterns of organization should be considered:
    (a) a period of from one to two years of guided work experience followed by a part-time or briefer full-time programmes of specialization;
    (b) part-time programmes;
    (c) full-time programmes as an extension of programmes given in specialized secondary institutions or given in tertiary institutions.
34. The high cost of equipment for the practical component of technical and vocational education requires that this be organized so that benefits received are in proportion to the cost. Consideration should be given to the following as a means of achieving this:
    (a) centralized workshops, or mobile units, could be used to serve several educational institutions;
    (b) workshops attached to educational institutions could be designed so that they are suitable for use by the community at large particularly for continuing education programmes;
    (c) although workshops and laboratories in advanced secondary or tertiary institutions should be designed primarily for pedagogical purposes, they might also be equipped and staffed so that equipment for use in technical and vocational studies in general education may be produced.
35. Enterprises should be closely associated in the practical training of those preparing for occupations in their particular sector, and should be encouraged to take responsibility, in co-operation with educational institutions, for the organization of this training.

Programme content

36. All programmes of technical and vocational education as preparation for an occupational field should:
    (a) aim at providing scientific knowledge, technical versatility and the broad skills and knowledge required for rapid adaptation to new ideas and procedures and for steady career development;
    (b) be based on an analysis of broad occupational requirements worked out for the long term between education authorities including organizations representing educational research and administration and employment authorities and occupational organizations concerned;
    (c) include a proper balance between general subjects, science and technology, and studies of both the theoretical and practical aspects of the occupational field, with the practical component in all cases related to the theoretical one;
    (d) stress developing a sense of professional values and responsibilities from the standpoint of human needs.
37. In particular programmes should:

(a) whenever possible be interdisciplinary in character as many occupations now require knowledge and training in two or more traditional areas of study;
(b) be based on curricula designed around core knowledge and skills;
(c) include studies of the social and economic aspects of the occupational field as a whole;
(d) include the study of at least one foreign language of international use which, while conducive to a higher cultural level, will give special emphasis to the requirements of communication and the acquisition of a scientific and technical vocabulary;
(e) include an introduction to organizational and planning skills;
(f) emphasize instruction in safety procedures relative to the materials and equipment used in a given occupational field and the importance of safe working conditions and the health aspects relative to the occupation as a whole.

38. While based on the above general principles and components, and thus pursuing in all cases broader educational aims, programmes in their practical aspect should be designed taking into account special occupational requirements with regard to the particular executive, organizational, analytical and practical skills required.

39. Technical and vocational education programmes leading to university qualification, while encouraging research and offering high-level specialization, should be developed with particular attention to:
(a) the inclusion of components directed to developing attitudes whereby those with broad responsibilities in technological fields constantly relate their professional tasks to larger human goals;
(b) relating more closely high technical and vocational education for the industrial and agricultural sectors to the requirements of these sectors. In this regard consideration should be given to creating within tertiary institutions, centres for the testing and certification of industrial and agricultural products, supervised by the public authorities and serving both educational and research purposes.

40. Programmes of technical and vocational education as preparation for occupations within the agricultural sector should be designed in accordance with the over-all social and economic requirements of rural development. Therefore:
(a) both general aspects and the technical and vocational aspects, while adapted in terms of both organization and content to the special requirements of agricultural occupations, should be of the same quality as those for other occupational areas;
(b) programmes should be directed to the development and application of technologies especially suited to rural development through close coordination between education and extension services and between these and research services and institutions;
(c) programmes should be directed to preparing qualified people for all types of occupations and ranges of technical competence necessary for rural development;
(d) programmes should be broadly conceived, including in addition to the special occupational area, an introduction to the commercial aspects

of agriculture and the functioning of rural economic institutions.

41. Where lack of resources limits the expansion of technical and vocational education, emphasis in the initial stages should be placed on developing programmes for occupations in areas of critical manpower shortage, and in areas of immediate development potential.

42. Programmes preparing for occupations in small industry, individual farming or the artisan trades, whether urban or rural, and particularly for self-employment, should include commercial studies enabling those engaged in such occupations to take responsibility not only for production, but also for marketing, competent management and the rational organization of the whole enterprise.

43. Programmes leading to occupations in the business and commercial sector should include:
    (a) a thorough grounding in the methods and skills developed as a result of the application of technology to business and office management and particularly to the acquisition and processing of information;
    (b) training in the organizational and management skills required for the smooth operation of enterprises in all economic sectors;
    (c) an introduction to marketing and distribution procedures.

44. Special attention should be given to developing programmes for preparing personnel at all levels for the social services sector (e.g. community and family work, nursing and paramedical occupations, nutrition and food technology, home economics and environmental improvement). Those programmes should:
    (a) emphasize the relation of the special occupational field to raising standards of living in terms of food, clothing, housing, medical services, the quality of family life or that of the environment as the case may be;
    (b) be well adapted to the special requirements of local conditions in particular those of climate and geography, materials available and community organization and social patterns.

VI. Technical and vocational education as continuing education

45. The development and expansion of technical and vocational education as continuing education, both within and outside the formal education system, and within the framework of lifelong education, should be a priority objective of all educational strategies and broad provision should be made for allowing everyone, whatever the educational qualifications achieved prior to employment, to continue both their professional and general education.

46. In addition to permitting adults to make up deficiencies in general education or professional qualifications, which has often been the only objective of continuing education, it should now:
    (a) offer possibilities of personal development and professional advancement;
    (b) permit the updating and refreshing of knowledge and practical abilities and skills in the occupational field;
    (c) enable the individual to adapt to technological changes in his occu-

pation or to enter another occupation if these changes render his particular job obsolete;

(d) be available throughout working life without restriction of age, sex, prior education and training or position;

(e) be broad in scope, including general education elements, and not simply specialized training for one particular job.

47. The appropriate authorities should be encouraged to provide the basic conditions for technical and vocational education as continuing education, including consideration of measures providing for paid educational leave or other forms of financial aid.

48. The technical and vocational aspect of continuing education should actively be encouraged through such means as:
   (a) widespread dissemination of information concerning the programmes available, and how one may take advantage of existing opportunities, including full use of mass media to this end;
   (b) recognition of successful completion of programmes in terms of remuneration and professional advancement.

49. Those responsible for organizing programmes of continuing technical and vocational education recognized by the public authorities should consider the following forms:
   (a) courses given during working hours at the place of work;
   (b) fuller part-time courses especially designed for continuing education given in secondary and tertiary institutions, already staffed and equipped for technical and vocational education;
   (c) evening and week-end courses given in the above types of institutions or in community centres;
   (d) correspondence courses;
   (e) courses given on educational television;
   (f) periodic seminars;
   (g) inter-enterprise programmes;
   (h) informal discussion groups created and organized on the initiative of students.

50. The following forms of organization of leave should be considered:
   (a) day release;
   (b) block release of varying lengths;
   (c) release for one or more hours during the working day.

51. Programmes of technical and vocational education as continuing education should:
   (a) be designed and taught on the basis of the special requirements of adults, and use teaching methods which take into account the expertise which they have already acquired;
   (b) contain a built-in mechanism for rapid adjustment to the needs of particular individuals or groups and to technological change.

52. Special provision should be made for groups with particular requirements:
   (a) in the case of women, because of the necessity of periods of absence from the labour force imposed by maternity and family responsibilities, in order to enable them to update their knowledge and to improve their professional skills for re-entry into employment;
   (b) to enable older workers to adapt to new occupations;

(c) to provide foreign workers and handicapped workers with specific facilities for pre-training to enable them to adapt to a training programme or to working life;
(d) the resources of continuing education should be used to offer unskilled and semi-skilled workers the opportunity to improve their qualifications.

53. Particular attention should be paid to the development of continuing education programmes suitable in rural areas in terms of content, physical location and time of year offered.

VII. Guidance

54. Guidance should be viewed as a continuous process and a vital element in education, directed to aiding all to make positive educational and occupational choices. It should ensure that the individual be provided with the necessary prerequisites:
(a) to become aware of his interests and abilities and able to set himself precise objectives;
(b) to pursue a course of education, whether preparatory or continuing, commensurate with these;
(c) to make decisions concerning his occupation, both in the initial and later stages, which lead to a satisfying career;
(d) to facilitate transitions between education and employment at whatever level or stage.

55. Guidance services on the national, local and institutional levels should ensure that the paths are kept open between education and initial training and employment, and employment and continuing education and training through:
(a) close liaison and co-ordination with training, counselling, employment and placement services;
(b) ensuring that all necessary information concerning employment and career opportunities is available and actively disseminated;
(c) ensuring that those in employment have access to information concerning opportunities in continuing education and training.

56. While emphasizing the needs of the individual, guidance for young people should be accompanied by information which gives them a realistic view of the opportunities available in a given occupational cluster, including information regarding probable developments in the market and in employment structures, and what may be expected in terms of remuneration, career advancement and possibilities for occupational change.

57. Particular attention should be given to guidance for girls and women:
(a) this guidance should cover the same broad range of education, training and employment opportunities as for boys and men;
(b) it should systematically encourage girls and women to take advantage of the opportunities available to them.

58. Guidance given in the technical and vocational aspects of general education during the observation or orientation cycle of secondary schooling should:
(a) cover a broad range of occupations with supplementary visits to work

places and acquaint the student with the eventual necessity of choosing an occupation and the importance of this choice being as rational as possible;

(b) aid students in making a positive choice concerning educational streams or options for those wishing to pursue technical and vocational education as preparation for an occupational field or training programmes outside the educational system, and aid those not continuing their formal education or entering training to find employment, while encouraging them to continue their education at a later date.

59. Guidance in technical and vocational education as preparation for an occupational field should:
    (a) inform the student of the various possibilities open in the particular field of interest, the educational background required and the possibilities for later continuing education available;
    (b) encourage the student to choose an educational programme which will limit his later employment options as little as possible;
    (c) follow the progress of the student during the educational programmes;
    (d) supplement the later stages of the programmes by short periods of work experience and study of real work situations.

60. Guidance in technical and vocational education as continuing education should:
    (a) help the employed adult choose the programme of continuing education most suited to his needs;
    (b) enable him to place himself in relation to the various levels of study and afford him the means of making effective choices.

61. Guidance should be given on the basis of:
    (a) knowledge of the individual which takes account of the social and family factors influencing his attitudes and expectations;
    (b) information obtained from objective evaluation of the results of testing including aptitude tests;
    (c) knowledge of his educational achievements and/or achievements in employment;
    (d) knowledge of employment and career opportunities as well as job satisfaction in the occupational sector in which he is interested or engaged and of demands made;
    (e) medical records indicating whether the student is physically able to pursue a given occupation.

62. The effectiveness of guidance services should continually be assessed and statistics kept on both the national and institutional levels through:
    (a) the keeping of cumulative records concerning the education of the students as well as follow-up records concerning his employment;
    (b) a built-in system of evaluation of both quality of staff performance and the methods used in order to effect change or improvement where needed.

VIII. The teaching and learning processes: methods and materials

63. In all aspects of technical and vocational education, the methodology of learning should assume equal importance in the teaching and learning

process with the subject-matter itself. All aspects of technical and vocational education should be oriented to the needs of the learner and directed to motivating him, and methods and materials developed accordingly.

64. Theory and practice should form an integrated whole: what is learned in the laboratory, workshop or in enterprises should be directly related to the mathematical and scientific foundations of the particular operation or process, and conversely, technical theory, as well as the mathematics and science sustaining it, should be illustrated through their practical applications.

65. Full use should be made of the resources provided by educational technology, with special emphasis on the methods and materials of self-education, in particular audio-visual aids, including multi-media systems, programmed instruction and the use of mass media.

66. The methods and materials used in technical and vocational education should be carefully adapted to the group to be taught. In this respect:
   (a) where the language of instruction differs from the native language, teaching materials should make maximum use of numerical and graphical representation, written material being kept to a minimum;
   (b) where materials developed in one country are adapted for use in another, this adaptation should be carefully made with due regard to local factors.

67. Machines and equipment used in workshops in educational institutions should be geared to the level and training of the users. This equipment should be simple and designed especially for pedagogical purposes without however being obsolete or teaching obsolete procedures. Training using complex equipment may be given more appropriately and efficiently on the job.

Evaluation

68. Evaluation should be an integral part of the teaching and learning process in technical and vocational education, and its major function should be the development of the particular individual in accordance with his interests and capacities.

69. Although standards of performance should be upheld, evaluation of the student's work should be made on a total basis considering among others his class participation, his interest and attitude, his relative progress, allowance being made for his aptitudes, and examinations and other tests.

70. Students should participate in the evaluation of their own progress and the evaluation of student work should have a system of feedback built into it so that learning problems and their causes may be identified and steps taken to correct them.

71. Continuous evaluation of the teaching process should be made by both teachers and their supervisors, with the participation of students as well, in order to determine the effectiveness of the methods and materials used, and to devise alternatives should the need arise. Continuous evaluation of the teaching-learning process should be undertaken with the participation of representatives from the occupational fields concerned.

IX. Staff

72. To enhance the achievement of the objectives of technical and vocational education, priority should be given to the recruitment and preparation of adequate numbers of well-qualified and competent teachers, administrators, and guidance staff and to the provision of the necessary training and other facilities to enable them to function effectively in their profession.
73. The emoluments and conditions of service which are offered should compare favourably with those enjoyed by persons with similar qualifications and experience in other occupational sectors. In particular, promotions, salaries and pension scales for technical and vocational education staff should take into account any relevant experience acquired in employment outside the educational sector.

Teaching staff

74. All teachers in technical and vocational education, including those who teach only practice, should be considered an integral part of the teaching profession and as such should be recognized as having the same status as their colleagues in other fields. In this regard:
    (a) the Recommendation concerning the Status of Teachers adopted by the Special Intergovernmental Conference on the Status of Teachers on 5 October 1966 is applicable to them especially as regards the provisions concerning preparation for a profession and continuing education; employment and career, the rights and responsibilities of teachers; conditions for effective teaching and learning; teachers' salaries; social security;
    (b) arbitrary distinctions between teachers employed by various types of educational institutions, e.g. specialized technical and vocational institutions and general education institutions, should be eliminated.
75. Teachers involved in any aspect of technical and vocational education, whether on a full-time or part-time basis, should possess the personal, ethical, professional and teaching qualities essential for the accomplishment of their work.
76. Teachers of technical and vocational aspects in general education should:
    (a) be familiar with a broad range of specialities;
    (b) develop the ability to relate these to each other as well as to the larger social, economic and historical and cultural context;
    (c) where this aspect of technical and vocational education serves primarily an occupation or educational orientation function, be able to give guidance.
77. Considering technical and vocational education as preparation for an occupational field, teachers in this area should have special qualifications depending on the occupation for which they are preparing students:
    (a) if the occupational field requires primarily practical skills the teacher should himself have long employment experience in the exercise of these skills;
    (b) if students are to be prepared for technician or middle management positions, teachers should have a thorough knowledge, preferably

acquired through appropriate practical experience, of the special requirements of this type of position;
   (c) if the occupational field requires research and theoretical analysis, e.g. an engineering field, the teacher should have a university education and be actively engaged in research himself.

78. Considering technical and vocational education as continuing education, teachers in this area should, in addition to the special preparation for teaching adults, have an adequate knowledge of the working environment of their students and have specialized knowledge and skills in their field.
79. Skilled professionals employed in appropriate sectors outside education should be invited to teach, at suitable points in technical and vocational education, certain programmes in schools, universities or other educational education, in addition to the usual qualifications, both professional classroom.
80. Teachers of general subjects in institutions which offer technical and vocational education, in addition to the usual qualification, both professional and in their teaching field, should receive a special initiation concerning the objectives and requirements of technical and vocational education.
81. Preparation for technical and vocational teaching should be given as a tertiary programme, thereby requiring completion of secondary education or its equivalent for entrance. All types of programme should be designed with the following objectives in mind:
   (a) to maintain standards of education and professional preparation in vigour for the teaching profession as a whole and to contribute to the raising of these over-all standards;
   (b) to develop in the future teacher the ability to teach both theoretical and the practical aspects of his field;
   (c) to ensure that the teacher will be qualified, with minimum further training, to teach other groups than those for which he was prepared initially.
82. Varied and flexible programmes, full time and part time, adapted to the special requirements of a wide variety of recruitment sources as well as to those of the field to be taught and the group or groups to be taught should be available.
83. In those cases where it is difficult for intending technical and vocational teachers to acquire employment experience, consideration should be given to creating units, attached to teacher-training institutions, for the production of equipment and teaching materials for the schools in which intending teaching staff would be required to work for varying lengths of time.
84. The professional preparation of all technical and vocational teachers should include the following elements:
   (a) educational theory both in general and as especially applying to technical and vocational education;
   (b) educational psychology and sociology as it especially applies to the group or groups for which the future teacher will be responsible;
   (c) special teaching methods appropriate to the field of technical and vocational education for which the future teacher is preparing and the groups to be taught, in methods of evaluation of student work, and in classroom management;

(d) training in the choice and use of the whole range of modern teaching techniques and aids presupposing the use of up-to-date methods and materials in the programme of professional preparation itself;
(e) training in how to create and produce appropriate teaching materials, of special importance in those cases where technical and vocational materials are in short supply;
(f) a period of supervised practical teaching experience before appointment to a teaching post;
(g) an introduction to educational and occupational guidance methods as well as to educational administration;
(h) a thorough grounding in safety and emphasis on the ability to teach safe working practice and habitually to set a good working example.

85. Staff responsible for the preparation of technical and vocational teachers should have obtained the highest qualifications possible in their field:
(a) teacher-educators responsible for special technical and vocational fields should have qualifications in their field equivalent to those of special subjects staff in other institutions and programmes of higher education, including advanced degrees and employment experience in related occupational fields;
(b) teacher-educators responsible for the pedagogical aspect of teacher preparation should themselves be experienced teachers in technical and vocational education and should possess the highest qualifications in a specialized field of education.

86. Staff responsible for the preparation of technical and vocational teachers should be actively engaged in research in their field and provision should be made for this in terms of a reasonable teaching load and access to appropriate facilities.

87. Teaching staff should be encouraged to continue their education, whatever the field in which they specialize, and should have the necessary means to do so. This continuing education which should be made available in a wide range of facilities, should include:
(a) periodic review and updating of knowledge and skills in the special field;
(b) periodic updating of professional skills and knowledge;
(c) periodic work in the occupational sector relating to the special field.

88. Account should be taken of a teacher's achievements in continuing education when the responsible authorities consider questions of promotion, seniority and status concerning him.

Administrative and guidance staff

89. Administrative responsibilities for technical and vocational education programmes should be entrusted to persons with the following qualifications:
(a) teaching experience in a field of technical and vocational education;
(b) proficiency acquired through study and employment experience in one of the fields taught in the programme;
(c) a broad vision of technical and vocational education as a whole and of the interrelation of the various aspects;
(d) a knowledge of administrative techniques.

90. The heads of establishments in technical and vocational education should

receive adequate administrative assistance so that they can devote most of their time to the highly important educational and scientific aspects of their work. Technical and vocational education establishments should have sufficient staff to provide the following services:
(a) advice and guidance for candidates and students;
(b) the preparation, supervision and co-ordination of all practical work and experiments;
(c) the maintenance of instruments, apparatus and tools in workshops and laboratories;

91. Administrators should keep up to date with new administrative techniques and trends through programmes of continuing education. Prospective administrators should receive special training in methods and problems involved in the task. This preparation should include:
(a) management methods appropriate to educational administration;
(b) methods of allocation of available resources given the objectives of the various programmes for which they will be responsible;
(c) planning methods.

92. Guidance staff should receive special preparation for their tasks whether they are specialists or are teachers serving also as guidance staff. This preparation should be equipped to make objective assessments of aptitude, interest and motivation and to have at hand up-to-date information concerning career and education opportunities. During this preparation they should acquire a direct knowledge of the economy and the world of work through systematically organized visits to enterprises and periods of time spent in enterprises. Guidance staff should be required and provided with facilities—including the opportunity for practical experience—to keep up with new methods of guidance and information as to new or changed educational training and employment opportunities.

X. International co-operation

93. Member States should give priority to international co-operation in the field of technical and vocational education.
(a) This co-operation, whether in the framework of bilateral or multilateral agreements, or through international organizations, should be directed to improving the quality of technical and vocational education and developing and expanding it where necessary.
(b) Every effort should be made to co-ordinate within any given country the international assistance activities in the field of technical and vocational education.

94. Member States should take special measures to provide foreigners (in particular migrants and refugees) and their children living within their territory with technical and vocational education. Such measures should take into account the special needs of such persons in the host country as well as in view of their possible return to their country.

95. Provision should be made at national, regional and international levels for the regular exchange of information, documentation, and materials of international interest obtained from research and development efforts on all levels concerning technical and vocational education, in particular:
(a) publications concerning, among others, comparative education, psy-

chological and pedagogical problems affecting general and technical and vocational education, and current trends;

(b) information and documentation concerning curriculum development, methods and materials, study opportunities abroad, employment opportunities including manpower requirements, working conditions and social benefits;

(c) teaching materials and social benefits;

(d) mass media programmes of an informational or pedagogical character.

96. Regional co-operation among countries having a common cultural heritage and facing common problems in the development or extension of technical and vocational education should be highly encouraged through:

(a) periodic meetings on the ministerial level and the establishment of a standing committee or organization to review policies formulated and actions taken;

(b) the creation of joint facilities for higher level research, the development of prototype materials and equipment, and the preparation of staff for the training of teachers where the costs of such facilities are too high to be sustained by any one country in a given region.

97. The development of both written and audio-visual teaching and learning materials which are suitable for international or regional use should be considered a priority area in international co-operation. These materials should contribute to the progressive establishment of common standards for professional qualifications acquired through technical and vocational education.

98. Member States should encourage the creation of a climate of opinion favourable to international co-operation in the field of technical and vocational education through:

(a) teacher and student fellowships and exchanges;

(b) establishment of sustained contacts between similar institutions in different countries;

(c) provision of employment experience abroad, particularly when opportunities at home are limited.

99. To facilitate international co-operation, Member States should apply within technical and vocational education internationally recommended standards and norms relating in particular to:

(a) system of measure;

(b) scientific and technical symbols;

(c) occupational qualifications;

(d) information processing;

(e) equivalencies of qualifications acquired through technical and vocational education implying standardization of curricula and testing, including aptitude tests, for some technical fields;

(f) safety and security through testing of materials and products.

100. Internationally recommended standards and norms concerning technical and vocational education should be continuously evaluated through sustained research concerning the effectiveness of their application in the various countries especially in order to facilitate the establishment of equivalence of qualifications and free movement of individuals between the different national systems of education.

Appendix III
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